Carl Xmitter

RCA

Broadcast Equipment

TT-6EL
VHF TV Transmitter

ES-560267

Operating Instructions

IB-8027023-P

Broadcast Equipment

Operating Instructions

TT-6EL
VHF TV Transmitter

ES-560267

Communications Systems Division/Front and Cooper Streets/Camden, New Jersey, U.S.A. 08102

6P7121M

EMERGENCY
FIRST AID INSTRUCTIONS

WARNING

VOLTAGES THAT ARE DANGEROUS TO LIFE ARE INVOLVED IN THE OPERATION OF THIS ELECTRONIC EQUIPMENT. OPERATING PERSONNEL MUST AT ALL TIMES OBSERVE ALL SAFETY REGULATIONS. DO NOT CHANGE TUBES OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH VOLTAGES APPLIED. DANGEROUS CONDITIONS MAY EXIST IN CIRCUITS WITH POWER CONTROLS IN THE OFF POSITION DUE TO CHARGES RETAINED BY CAPACITORS, ETC. ALWAYS DISCHARGE AND GROUND CIRCUITS PRIOR TO TOUCHING THEM TO AVOID PERSONAL INJURY OR LOSS OF LIFE.

Personnel engaged in the installation, operation, or maintenance of this equipment or similar equipment are urged to become familiar with the following rules both in theory and practice. It is the duty of all operating personnel to be prepared to give adequate Emergency First Aid and thereby prevent avoidable loss of life.

RESCUE BREATHING

GENERAL INFORMATION

A. START IMMEDIATELY, SECONDS COUNT

Do not move victim unless absolutely necessary to remove from danger. Do not wait or look for help or stop to loosen clothing. Warm the victim or apply stimulants. The main purpose is to GET AIR INTO THE VICTIM'S LUNGS.

B. WIPE OUT VICTIM'S MOUTH

Wipe out quickly any mucus, food, or any foreign matter in the victim's mouth using your fingers or a cloth wrapped around your fingers.

C. LOOSEN CLOTHING - KEEP WARM

Do this when the victim is breathing by himself or help is available. Keep him quiet as possible and from becoming chilled. Otherwise, treat him for shock.

D. DON'T GIVE UP

Continue emergency rescue breathing without interruption until victim is breathing without help or until all hope of reviving him as determined by a physician is gone.

E. CALL A PHYSICIAN

Have someone summon medical aid since respiratory and other disturbances may develop as a aftermath. A physician is necessary during the recovery period.

PROCEDURE

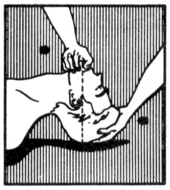


FIG. A

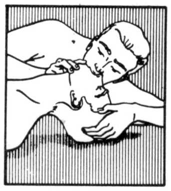


FIG. B

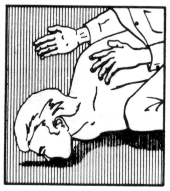


FIG. C

TILT HEAD BACK - Lift neck and point chin up to open air passage.

EXTEND JAW - Pull or push jaw into jutting out position (Fig. A).

PINCH NOSE - Close nostrils to prevent air leakage, or close mouth when using mouth-to-nose breathing.

BLOW - Seal victim's mouth or nose with your mouth. (Fig. B) Blow until chest rises.

REMOVE MOUTH - Listen for exchange of air; if none, check throat for obstruction. To remove it, place victim in position shown in Fig. C, and slap sharply between shoulder blades.

REPEAT - 12 times per minute for adults; at least 20 times per minute for children.

BURNS

SKIN REDDENED: Apply ice cold water to burned area to prevent burn from going deeper into skin tissue. Cover area with clean sheet or cloth to keep away air. Consult a physician.

SKIN BLISTERED OR FLESH CHARRED: Apply ice cold water to burned area to prevent burn from going deeper into skin tissue. Cover area with clean sheet or cloth to keep away air. Treat victim for shock and take to Hospital.

EXTENSIVE BURN-SKIN BROKEN: Cover area with clean sheet or cloth to keep away air. Treat victim for shock and take to hospital.

TABLE OF CONTENTS

Page

INTRODUCTION 7

DESCRIPTION 15

- Construction Features 15
- Circuit and Design Features 17
- Circuit Description 21
  - Exciter Circuits 21
    - Visual Section 21
    - Aural Section 21
    - AFC Circuits 24
    - Other Exciter Circuits 25
  - Visual Modulator 25
    - Video Circuits 25
    - Clamp Circuits 27
    - Modulator Stage 28
  - Aural R-F Circuits 30
  - Visual R-F Circuits 31
  - Power Supplies 31
  - Low Voltage Regulator 31
  - Line Regulator Unit 32
  - Carrier-Off Monitor 32
  - 4.75 MHz Low Pass Filter 32
  - Harmonic Filters 32
  - Vestigial Sideband Filter 32

ADJUSTMENTS AND TUNING 33

- Adjustments 33
  - Transformer Primary Tap Check 33
  - Preliminary Adjustments and Control Settings 33
  - Control Circuits Check 35
  - Tube Filament Voltages 41
  - Ventilating System Adjustments 42
- Tuning 43
  - Exciter 43
  - Visual Modulator - Initial Adjustments 49
- R-F Tuning 51
  - First Aural Amplifier 60
  - Second Aural Amplifier Neutralization 60
  - Second Aural Amplifier Tuning 61
  - Aural Reflectometer Calibration 62
  - Aural VSWR Measurement 62
  - Aural Monitoring Unit Calibration 62
  - First Visual Amplifier Tuning 63
  - Second Visual Amplifier Tuning 65

TABLE OF CONTENTS (CONTINUED)

Page

- Visual Modulated Amplifier Neutralization 65
- Visual Modulated Amplifier Tuning 66
- Visual Reflectometer Calibration 66
- Visual VSWR Measurement 67
- Transmitter Final Adjustments 68
  - Aural Carrier Frequency Zero Deviation Adjustment 68
  - Off Frequency Interlock Circuit Adjustment 68
- Color Signal Adjustments 68
  - General 68
  - System Adjustments 69
  - Visual Modulator - Final Adjustments 71
  - Adjustment of Output Regulation Compensation Circuit 74
  - Variations in Frequency Response with Brightness 76
  - Envelope Delay 76
    - General 76
    - Test 76
  - Subcarrier Amplitude Vs Luminance Amplitude 78
  - Burst Vs Subcarrier Phase 78

OPERATION 79

- Starting and Stopping the Transmitter 79
- Monochrome Operation 79
- Emergency Operation - AFC Failure 82
- Color Operation 82
- Overloads and Power Interruptions 84

MAINTENANCE 85

- Periodic Maintenance 85
- Mechanical Servicing 85
  - Cleaning Silvered Surfaces 85
  - Lubrication 85
  - Blower Shaft Alignment 85
  - Tuning Drives 87
  - Relays and Contactors 87
  - Magnehelic Meter 87
- Electrical Servicing 88
  - Tubes 88
  - Modulator 88
    - Video Sweep Alignment 89
      - Preliminary 89
      - 1st Video Stage Alignment 90
      - Inverter Stage Alignment 90
      - Linearity Corrector Alignment 90
      - 2nd Video Stage Alignment 90

TABLE OF CONTENTS (CONTINUED)

Page

- 3rd Video Stage and Modulator Alignment 91
- High Peaker Adjustment 91
- Overall Alignment 91

Monitor Stage Adjustment 92

Miscellaneous Adjustments 92

- Modulator Amplitude Capability 92
- Pedestal Level Shift 92
- Color Subcarrier Capability 93
- Square Wave Response 93

Tube Socket Voltages 93

Control Circuits Troubleshooting 93

Waveforms 98

High Voltage Silicon Rectifier Stacks 98

REPLACEMENT PARTS LIST 131

LIST OF ILLUSTRATIONS

Figure		Page
1	RCA Type TT-6EL Television Broadcast Transmitting Equipment	8
2	TT-6EL Transmitting Equipment Location	16
3	TT-6EL Transmitting Equipment Power Distribution/Signal Flow Block Diagram	22
4	Aural and Visual Exciter, Block Diagram	23
5	Visual Modulator, Block Diagram	26
6	Modulated Output Stage, Simplified Schematic	29
7	Typical Exciter Waveforms (Sheet 1 of 2)	45
8	Aural Power Curve-Efficiency Factor vs Power Output	63
9	Ideal Response of Visual Modulated Amplifier	67
10	Color Signal Adjustment Unit Interconnection Diagram	70
11	Waveform Produced by Linearity Checker	72
12	Block Diagram of Test Setup for Linearity Adjustments and Differential Phase Measurements	73
13	Reference Waveforms for Modulation Depth	74
14	Oscillograms, Waveforms During Linearity and Phase Adjustments	75
15	Typical Monochrome Signal Waveform	82
16	Oscillograms, Waveforms of Visual Modulator MI-34471-A (Sheet 1 of 6)	99
17	Control Unit - Front View (Sheet 1 of 2)	106
18	Control Unit - Right Oblique Rear View (Sheet 1 of 2)	108
19	Control Unit - Left Oblique Rear View	110

LIST OF ILLUSTRATIONS (CONTINUED)

Figure Page

20 Low Voltage Regulator, Front View 111
21 Low Voltage Regulator, Rear View 112
22 6 kW Unit, Front View (Sheet 1 of 2) 113
23 6 kW Unit, Rear View (Sheet 1 of 2) 115
24 6 kW Unit, R-F Box (Sheet 1 of 2) 117
25 Aural and Visual Exciter, Front View (Sheet 1 of 2) 119
26 Aural and Visual Exciter, Rear View (Sheet 1 of 2) 121
27 Visual Modulator, Front View (Sheet 1 of 2) 124
28 Visual Modulator, Rear View (Sheet 1 of 3) 126
29 Rear Enclosure Components (Sheet 1 of 2) 129
30 TT-6EL Transmitting Equipment Schematic (Sheet 1 of 2) 161/162
31 Aural and Visual Exciter Schematic 163/164
32 Visual Modulator Schematic 165/166
33 Monitoring Unit MI-19087-A 167/168
34 Aural Signal Circuits Functional Diagram 169/170
35 Visual Signal Circuits Functional Diagram 171/172
36 Control Unit Wiring Diagram 173/174
37 Low Voltage Regulator Wiring Diagram 175/176
38 6 kW Unit Wiring Diagram 177/178
39 6 kW R-F Unit Wiring Diagram 179/180
40 Aural and Visual Exciter Wiring Diagram 181/182
41 Visual Modulator Wiring Diagram 183/184
42 Switchgear Panel Wiring Diagram 185/186
43 Plate Contactor Panel Wiring Diagram 187/188
44 Rectifier Panel Wiring Diagram 189/190
45 Rectifier Assembly Wiring Diagram 191/192
46 Wire Chart (Sheet 1 of 5) 193/194

LIST OF TABLES

Table Page

1 Technical Summary 9
2 Equipment List 13
3 Component Prefix and Suffix Designations 18
4 Symbol Vs Component Type 19
5 Tube Complement - TT-6EL Transmitting Equipment 20
6 Recommended Test Equipment 34
7 Transformer Primary Taps and Connections 35
8 Crystal and Carrier Frequencies 37
9 Overload Relay Settings 40
10 Tube Socket Filament Voltages 41
11 Ventilating System Control Settings 42
12 Pressure Readings At Transmitter Site Altitudes 43
13 Exciter Switch Settings 44
14 Exciter Tuning, Visual R-F Chain 44

LIST OF TABLES (CONTINUED)

Table		Page
15	Exciter Tuning, Reference Frequency Oscillator and Dividers	48
16	Exciter Tuning, Aural R-F Chain	48
17	Exciter Tuning, Mixers and Difference - Frequency Dividers	48
18	Exciter Frequencies (Each Stage)	50
19	Typical Meter Panel Indications	52
20	Aural Section, Approximate Dial Settings	61
21	Visual Section, Approximate Dial Settings	64
22	Manual Starting Procedure	80
23	Symptoms and Remedies for Optimum Color Operation	83
24	Recommended Maintenance Schedule	86
25	Fuse Sizes and Symbols	87
26	Modulator Servicing Equipment	88
27	Visual Modulated Test Jacks	89
28	Typical Voltages, Exciter Tube Sockets	94
29	Typical Tube Socket Voltages, Modulator MI-34471-A Monoscope Test Pattern	95
30	Typical Tube Socket Voltages, Modulator MI-34471-A, No Signal	96
31	Typical Tube Socket Resistances, Modulator MI-34471-A	97

INTRODUCTION

The RCA Type TT-6EL Television Broadcast Transmitting (see Figure 1) is designed for color or monochrome transmission on Channels 2 through 6. A high definition AM visual signal and an FM aural signal are generated and controlled in accordance with FCC and EIA transmission requirements. The visual output power is 6 kW peak at the output of the vestigial sideband filter.

A typical TT-6EL installation, as major components, a transmitter assembly, two harmonic filters, a 4.75 MHz low-pass filter, and a vestigial sideband filter. Available optional items include a TTC-5B control console, a carrier-off monitor, a 50-hertz kit, a R-F load and wattmeter, and input and monitoring equipment.

Electrical and mechanical specifications and power line requirements for the complete system are given in TABLE 1. TECHNICAL SUMMARY. The equipment supplied is listed in TABLE 2. EQUIPMENT LIST.

Included in the following paragraphs are physical and electrical descriptions, adjustments and tuning procedures, operating instructions, maintenance information, and replacement parts list. Reference wiring and schematic drawings are included in this instruction book to aid during servicing and repair.

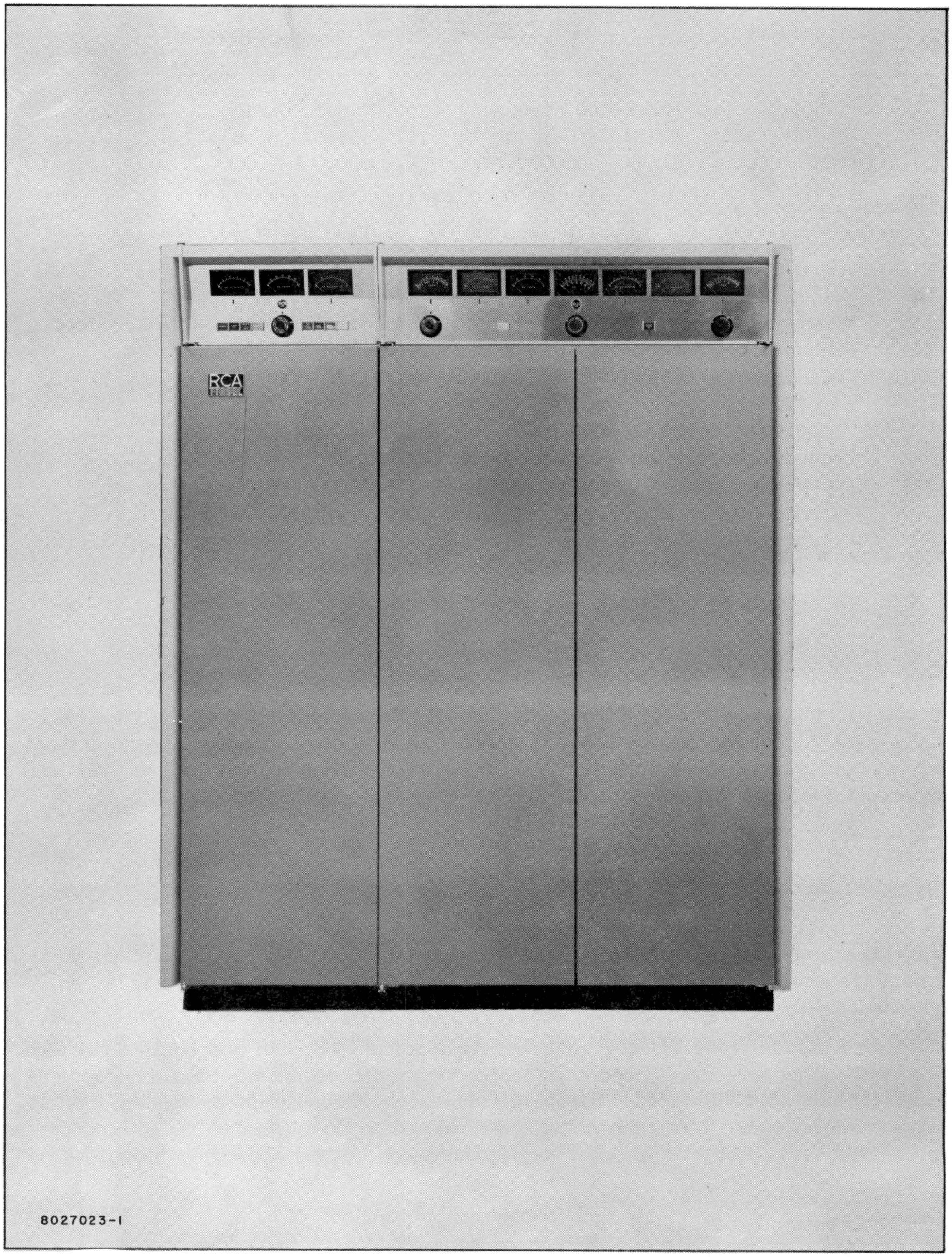

RCA
8027023-1

Figure 1 — RCA Type TT-6EL Television Broadcast Transmitting Equipment

TABLE 1. TECHNICAL SUMMARY

Electrical Specifications	Visual	Aural
Type of Emission	A5	F3
Frequency Range (Channels 2 to 6)	54-88 MHz	54.88 MHz
Rated Power Output	6.0 kW[1]	5.5 kW[2]
Minimum Power Output	2.5 kW[1]	0.5 kW[2]
R-F Output Impedance	50/51.5 ohms	50/51.5 ohms
Input Impedance	75 ohms	600/150 ohms
Input Level	0.7 v peak-to-peak minimum	+10 ±2 dBm
Amplitude vs. Frequency Response With respect to the response at 200 kHz, as measured by Sideband Response Analyzer BW-5B at transmitter mid-characteristic. 4.75 MHz attenuation requires use of 4.75 MHz Low Pass Filter MI-27132-A in the video input circuits.	Upper Sideband: +1, -1.5 dB from carrier plus 0.2 MHz to carrier plus 2.0 MHz +1, -1.5 dB at carrier plus 3.58 MHz +1, -1.8 dB of response at carrier plus 3.58 MHz between carrier plus 2.0 MHz and carrier plus 4.18 MHz -20 dB max. at carrier plus 4.75 MHz Lower Sideband: +1, -1.5 dB at carrier minus 0.5 MHz -20 dB max. at carrier minus 1.25 MHz -42 dB max. at carrier minus 3.58 MHz	Uniform ±1 dB from 50 Hz to 15kHz
Variation in Frequency Response with brightness Maximum variation with respect to response at midcharacteristic measured with the Sideband Response Analyzer, BW-5B at brightness levels of 22.5% and 67.5% of sync peak, using approx. 20% (p-p) modulation.	±1.5 dB	

[1] Measured at the output of the vestigial sideband filter.

[2] Measured at the input to the diplexer.

TABLE 1. TECHNICAL SUMMARY (CONTINUED)

Electrical Specifications	Visual	Aural
Carrier Frequency Stability Maximum variation for a period of 30 days without circuit adjustment.	±1 kHz	+500 Hertz[3]
Modulation Capability	12.5 ±2.5% (Reference White)	±50 kHz
Audio Frequency Distortion		1.5% Maximum 50-100 Hertz 1.0% maximum 100-7500 Hertz 1.5% maximum 75-15 Kilohertz
F-M Noise, below ±25 kHz swing.		60 dB
A-M Noise (rms)	45 dB below 100% modulation	50 dB below carrier
Amplitude Variation, over one picture frame	Less than 5% of the peak of sync level	
Regulation of Output	7% maximum	
Burst vs. Subcarrier Phase Maximum departure from the theoretical when reproducing saturated primary colors and their complements at 75% amplitude.	±5° maximum	
Subcarrier Phase vs. Brightness Maximum phase difference with respect to burst, measured after the VSBF, for any brightness level between 75% and 15% of the sync peak using 10% (p-p) modulation as indicated by a conventional diode demodulator. In addition, the total differential phase between any two levels shall not exceed 10 degrees.	±7° maximum	
Subcarrier Amplitude Maximum departure from theoretical when reproducing saturated primary colors and their complements at 75% amplitude.	±10% maximum	

---

[3] Maximum variation with respect to the standard 4.5 MHz separation between aural and visual carriers.

TABLE 1. TECHNICAL SUMMARY (CONTINUED)

Electrical Specifications	Visual	Aural
Linearity (Differential Gain) Maximum variation in the amplitude of a 3.58 MHz sine wave modulating signal as the brightness level is varied between 75% and 15% of sync peak. The gain shall be adjusted for 10% (p-p) modulation of the 3.58 MHz signal when the brightness is at the pedestal level. This is equivalent to 5% (p-p) modulation as indicated by a conventional diode demodulator connected after the VSBF.	1.5 dB maximum	
Envelope Delay vs. Frequency Maximum departure from standard curve. The tolerances vary linearly between 2.1 and 3.8 MHz and between 3.58 and 4.18 MHz. To meet the specification, a properly terminated phase correction network, ES-34034-B is required in the video input circuit of the transmitter.	±.08 u sec. from 0.2 to 2.1 MHz ±.04 u sec. at 3.58 MHz ±.08 u sec. at 4.18 MHz	
Harmonic Attenuation Ratio of any single harmonic to peak visual fundamental	At least 60 dB	At least 60 dB

TABLE 1. TECHNICAL SUMMARY (CONTINUED)

POWER LINE REQUIREMENTS	
Transmitter:	
Line	230/208 volts, 3-phase, *50/60 Hertz
Slow Line Variations	±5% Maximum
Rapid Line Variations	±3% Maximum
Power Consumption:	
Black Picture and 1.2 kW Aural	18.3 kW
Black Picture and 5.0 kW Aural	24.6 kW
Average Picture and 1.2 kW Aural	14.3 kW
Average Picture and 5.0 kW Aural	20.6 kW
Crystal Heaters:	
Line	115 volts, single-phase, 50/60 Hertz
Power Consumption	28 Watts
Maximum Altitude (At rated power and normal plate voltages)	7500 Feet
Ambient Temperature	0° to 45°C
Cooling Requirements:	
Air Intake, Total (Approximate):	
Sea Level	1000 CFM
4000 Feet	1158 CFM
7500 Feet	1320 CFM
Heat Dissipation (Average):	
1.2 kW Aural Output	11 kw or 625 BTU/MIN
5.0 kW Aural Output	13.5 kw or 770 BTU/MIN
Temperature Rise, Air through Transmitter (Approximate):	
Visual Exhaust Air At Black Picture	29°C (52°F)
Visual Exhaust Air At Average Picture	18°C (32°F)
Aural Exhaust Air At 1.2 kW	8°C (14°F)
Aural Exhaust Air At 5.0 kW	20°C (36°F)

*Transmitter requires 50-cycle conversion kit (MI-34467-A) for 50-cycle operation

MECHANICAL SPECIFICATIONS	
Weight (Approximate)	4000 lbs.
Dimensions:	
Overall Length (Front Line Cabinets Only)	70-1/4"
Overall Height (Front Line Cabinets Only)	84"
Depth (Front Line Cabinets Only)	18"
Overall Depth	79-1/2"
Finish:	
Doors	Shadow Blue
End Shields and Top	Midnight Blue
Cabinet Interior	Aluminum Epoxy
Transmitter Enclosure	Silver Gray

TABLE 2. EQUIPMENT LIST

TT-6EL TELEVISION BROADCAST TRANSMITTING EQUIPMENT

ES-560267

Qty	Description	Reference
1	Control Unit	MI-27180-B
1	6 kW Unit	MI-34570-A
1	Set of Panels	MI-34472-A
1	Rectifier Panel	MI-34573-A
1	Transformer, Filter Assembly	MI-34590
1	Transformer	MI-34594
1	Blower	MI-34463
1	Blower Enclosure and Filter Panel	MI-34464
1	Installation Material	MI-34592-A
1	Wiring Material	MI-34593-A
1	Monitoring Diode	MI-19051-B
2	Harmonic Filter (selected for customer's channel):	
	Channel 2	MI-27317-2
	Channels 3 and 4	MI-27317-3
	Channels 5 and 6	MI-27317-5
1	Vestigial Sideband Filter (selected for customer's channel)	ES-27234
1	Side Panels (left-hand and right-hand end shield)	MI-34599
1	Front Left-hand Door (with logo type mount)	MI-34598-2
1	Left-hand Door	MI-34598-3
1	Front Right-hand Door	MI-34598-1
1	Exciter (including tubes) consisting of: 1 Basic Exciter (MI-27475-A) 1 Frequency Determining Parts Kit (MI-34588) to be installed during customer tuning.	MI-27475-AL
1	Modulator (including tubes)	MI-34471-A
1	Low Voltage Regulator	MI-27469-A
1	Reflectometer	MI-27464
1	4.75 MHz Low Pass Filter	MI-27132-A
1	Finish Touch-up Kit	MI-27660-C
1	Miscellaneous Hardware Kit	MI-560479
1	Tool Kit	MI-27088-A
2	Crystal Units (Visual) (selected for customer's channel)	MI-27492
1	Set of Operating Tubes (less modulator and exciter tubes)	ES-34298-A
*	Set of 100% Spare Tubes	ES-34298
*	Set of Minimum Spare Tubes	ES-34260
3	Coupling, 90° Miter Elbow (1-5/8 inches)	MI-19112-18NF
2	Coupling, Reducer (3-1/8 to 1-5/8 inches)	MI-19113-C7
4	Coupling (1-5/8 inches) consisting of: 1 Sleeve, outer (443206-11)	MI-19112-8

TABLE 2. EQUIPMENT LIST (CONTINUED)

Qty	Description	Reference
	1 Connector, inner (8888794-2)	
	2 Clamps (897258-2)	
2	Coupling (3-1/8 inches) consisting of:	MI-19313-8
	1 Sleeve, outer	
	1 Connector, inner	
	2 Clamps	
*	R-F Load and Wattmeter (7.5 kW)	MI-27396
*	Transmission Line and Fittings (3-1/8 inches, 51.5 ohm)	MI-19313 NF
*	Transmission Line and Fittings (1-5/8 inches, 51.5 ohm)	MI-19112
*	Control Console Equipment (TTC-5B)	ES-561900
*	50 Hertz Conversion Kit	MI-34467-A
1	Line Regulator (single phase)	MI-27472
1	Line Regulator Control Panel	MI-27471
*	Carrier-off Monitor	ES-27235-A
*	Input and Monitoring Equipment (unwired racks for color operation)	
1	Nameplate (supply 1, to be mounted at time of installation to MI-27180-B control unit; engraved as per sales instruction and example outline below): Type: TT-6EL Serial: Per sales instruction Output: 6000 W Freq: Channel of operation	MI-28180-1
1	Set of Installation Drawings	3456058-501
1	Instruction Book	IB-8027023
1	Installation Instruction Book	IB-8027024

* Supplied if and as specified on sales order.

DESCRIPTION

The following paragraphs provide both a physical and electrical description of the TT-6EL Transmitting Equipment. Included are construction features, circuit and design features, and various circuit descriptions.

CONSTRUCTION FEATURES

Although the transmitter consists of two sections, the entire unit is essentially one cabinet with one access door on the side. When the door is opened to allow entry to a walk-in space, an interlock removes plate power and operates a high voltage grounding relay. A bar-interlock attached across the door will break the primary circuit of the high voltage plate transformer. The transformer filter assembly, main plate transformers, and the ventilating system blower are located on the floor toward the rear of the enclosure. The left wall of the enclosure supports the AC MAIN LINE and AUXILIARY circuit breakers and Line Regulator Control Panel. The rear wall of the enclosure supports the plate contactor, rectifiers, and other power supply components. The overall arrangement of the components results in compactness and a reduced floor space requirement.

The control section of the transmitter, which has a non-interlocked front door, is located on the left side of the front panel. Behind the door are the auxiliary switches, the control circuit breaker, the overload relays, and the relays for the associated circuits. A single row of lights for indicating circuit overloads is mounted behind the front door of the cabinet. A panel at the top of the cabinet contains meters, indicator lamps, and pushbutton indicator lamps which indicate the voltage and operating status of the transmitter and control the application of power to the transmitter circuits. Also contained on the meter panel is a switch which selects the phase of the line or regulated voltage being metered.

Next to the control section is the 6 kW Unit which contains the aural and visual R-F circuits. The modulator and exciter are located behind the doors in the lower portion of this cabinet. The chassis of the modulator and exciter are hinged for easy accessibility to circuit components.

The blower supplies air for cooling the tubes and components and is mounted in a sound-insulated enclosure which reduces the noise level in the transmitter room. To facilitate the flow of air, a duct assembly is connected between the blower and the bottom of the 6 kW Unit. Within the 6 kW unit, a system of air chambers and ducts carries the air to cool the equipment and most of the tubes. Two intake filters are mounted in the wall adjacent to the blower blower. The exhaust air is continually forced from the equipment and vented at the top of the transmitter cabinets. It is recommended that external duct work be installed to remove the heated air from the vicinity of the transmitter, but this duct work should not cause a back pressure greater than 0.2 inch water gauge.

This reduces the load on room air conditioning and also provides a source of heated air during colder periods. A further reduction to the to the air conditioning load can be accomplished by enclosing the front of the transmitter with a drop wall and access door. Air conditioning for operation comfort could be confined to only the area in front of the transmitting equipment and would amount to approximately 5% of the total heat dissipation.

The location of the major units of the TT-6EL Transmitting Equipment is shown in Figure 2. Each circuit component in the transmitter carries a prefix number which designates the

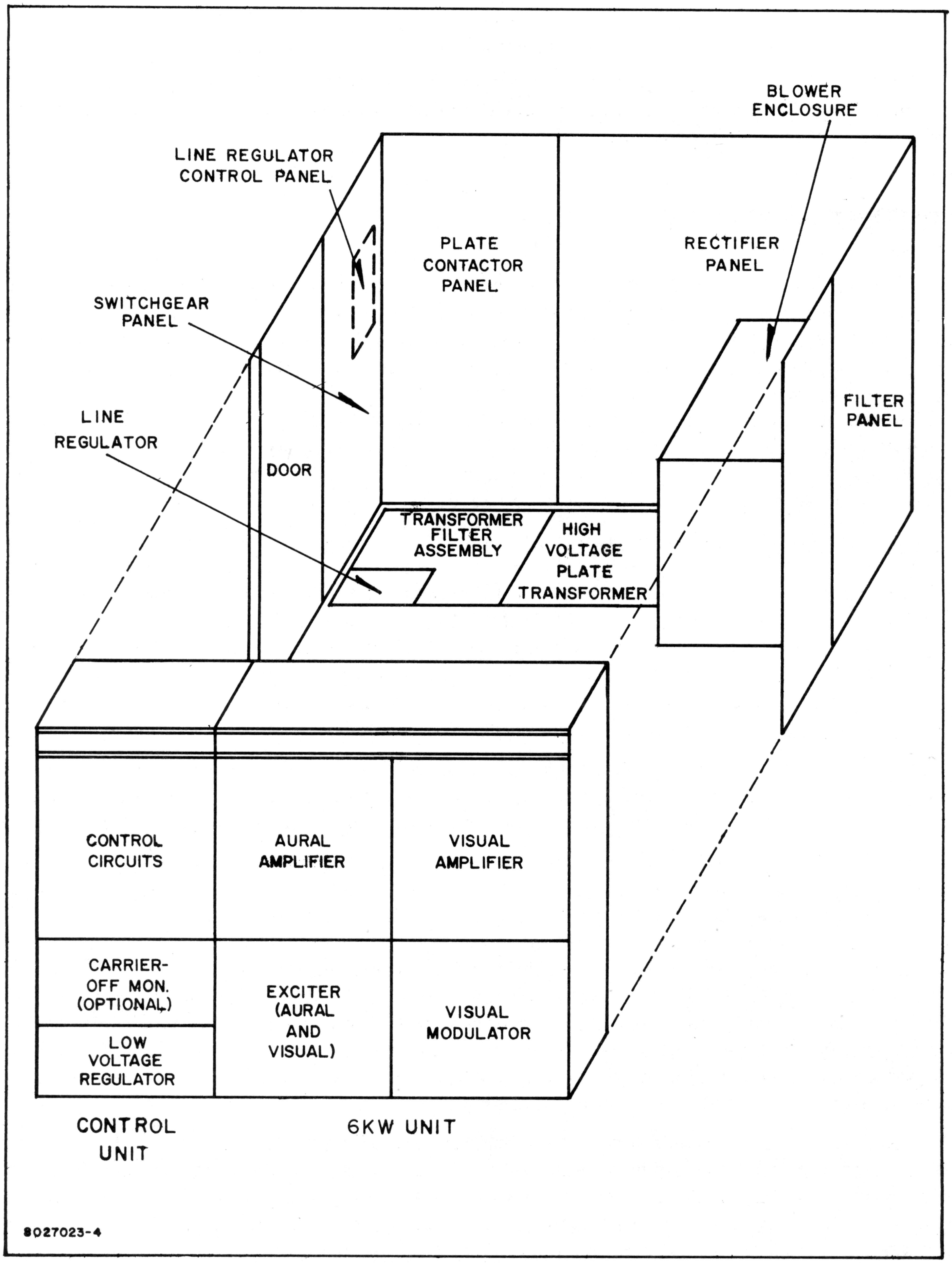

BLOWER ENCLOSURE
LINE REGULATOR CONTROL PANEL
PLATE CONTACTOR PANEL
RECTIFIER PANEL
SWITCHGEAR PANEL
FILTER PANEL
LINE REGULATOR
DOOR
TRANSFORMER FILTER ASSEMBLY
HIGH VOLTAGE PLATE TRANSFORMER
CONTROL CIRCUITS
AURAL AMPLIFIER
VISUAL AMPLIFIER
CARRIER-OFF MON. (OPTIONAL)
LOW VOLTAGE REGULATOR
EXCITER (AURAL AND VISUAL)
VISUAL MODULATOR
CONTROL UNIT
6KW UNIT
8027023-4

Figure 2 — TT-6EL Transmitting Equipment Location

general location of the item and a suffix number which identifies the individual items. Table 3 lists the component prefix and suffix designations assigned to the TT-6EL Transmitting Equipment. In addition, each component designation contains a letter symbol which indicates the class or type of component. Table 4 lists component types by their alphabetical classification.

CIRCUIT AND DESIGN FEATURES

A complete list of tubes used in the TT-6EL Transmitting Equipment is provided in Table 5.

Two separate, relay-selected, visual crystal oscillators are used in the exciter. The relays may be operated locally by a switch on the exciter, or remotely by a suitable external switch connected through the control section. The inter-carrier frequency control circuit of the exciter accurately maintains the separation between the aural and visual carriers. If a failure occurs in the frequency control circuit, it can be switched off and the aural output frequency can be controlled by manual adjustment.

Linearity correction circuits incorporated in the visual modulator may eliminate the need for a stabilizing amplifier at many transmitter installations.

The use of silicon rectifiers in the power supplies eliminates the close temperature control required for mercury vapor rectifier tubes.

Appropriate safe-guards, such as overload circuits and air and door interlocks, are provided for the protection of personnel and equipment. A contactor in the high voltage supply will automatically ground the high voltage when the access door is opened. In addition, grounding sticks are supplied for use by personnel when performing circuit maintenance or repair.

Reflectometer units in the aural and visual output lines allow monitoring of the output power and provide a means for determining the Voltage Standing Wave Ratio (VSWR).

An optional item, Carrier-off Monitor (ES-27235-A), will remove plate voltages for the equipment when the R-F power drops below a preset value. This item also provides a power indication feature during remote operation.

The Vestigial Sideband Filter ES-27234 is tuned for a specific channel and will attenuate a portion of the lower sideband to make the signal meet FCC anf EIA requirements. Harmonic Filters MI-27317, located in the output of each transmitter section, will attenuate the output frequencies above the operating channel.

The Monitoring Diode MI-19051-B is used in conjunction with a unit such as the Master Monitor for monitoring the picture. When TTC-5B control console ES-561900 is used, a chopper in the console is used as a check on the percentage of modulation. Additional information on this circuit is given in the TTC-5B control console instruction book IB-30259-1.

Remote control operation of the TT-6EL Transmitting Equipment is possible. The remote control connections can be made through connections to the necessary meter shunts and motors required for controlling the visual power output, the aural power output, the video gain, and the pedestal level.

TABLE 3. COMPONENT PREFIX AND SUFFIX DESIGNATIONS

Unit	Prefix No.	Location	Suffix No.	Example
Control Unit MI-27180-B	1	Control Section	1-99	1K16
	1	Low Voltage Regulator	201-299	1M201
6 kW Unit, MI-34570-A	2	General	1-99	2R51
	2	Exciter	101-299	2V178
	2	Modulator	301-599	2R503
	2	Aural R-F Unit	601-649	2L611
	2	Visual R-F Unit	651-699	2C672
Reflectometer, Aural	6	Aural Output Line	1 up	6R3
	7	Visual Output Line	1 up	7R3
Plate Transformers, Blower, and HV Filter	10	Enclosure Floor	1 up	10T1
Switchgear and Plate Contactor Panels	11	Enclosure	1 up	11S1
Rectifier Panel, MI-34573-A	12	Enclosure	1 up	12CR15

TABLE 4. SYMBOL VS COMPONENT TYPE

Sym. Des.	Item
B	Blower, motors, phase shifters
C	Capacitors
CR	Crystal or metallic rectifiers, thyrite resistors, thermistors, and varistors
E	Terminals
F	Fuses
HR	Heaters and thermal relay elements
I	Indicator Lamps
J	Connector Jacks
K	Relays or contactors
L	Inductors
M	Meters
P	Connector plugs
R	Resistors
S	Switches or interlocks
T	Transformers
TB	Terminal boards
V	Tubes
VR	Voltage regulators
XC	Sockets for capacitors
XI	Sockets for indicator lamps
XV	Sockets for tubes
XY	Sockets for crystals
Y	Crystals (oscillating)
Z	Directional couplers, network assemblies

TABLE 5. TUBE COMPLEMENT — TT-6EL TRANSMITTING EQUIPMENT

RCA Type	Exciter	Modulator	R-F Units	Low Voltage Regulator	Total
2D21	1				1
6AC7	6				6
6AK5	2				2
6AL5		2	2		4
6AQ5	1				1
6AS6	3				3
6AS7-GA		2		3	5
6CL6		5			5
6CX8		2			2
6EA8		2			2
6J6	1				1
6SL7-GT		2		1	3
6V6	3				3
12AT7	1				1
5651		2		2	4
5763	9				9
5933		2			2
6146		7			7
7034			1		1
6336-A		2			2
4CX300A			2		2
4CX5000A			2		2
OA2		1			1
OB2		10			10
OC3		2			2
OD3	1	2			3
TOTAL	28	43	7	6	84

CIRCUIT DESCRIPTION

The following paragraphs provide an electrical description of the major circuits (exciter, modulator, power supply, etc.) in the TT-6EL Transmitting Equipment. A combination power distribution/signal flow block diagram of the major circuits is shown in Figure 3.

EXCITER CIRCUITS

One frequency stabilized exciter is used to obtain both visual and aural outputs, as shown in Figure 4. The visual and aural outputs are at carrier frequencies. An automatic frequency-control circuit maintains the standard 4.5 MHz separation between carriers. An off-frequency circuit prevents uncontrolled frequency operation by cutting off the plate voltage to the stages that follow the exciter.

Visual Section

The visual oscillator section is composed of two crystal oscillator stages (2V119 and 2V120) having separate temperature controlled crystals (2Y101 and 2Y102). As shown in Figure 31, the plate circuits of the oscillators are connected together, but latching relay 2K101 prevents the operation of more than one oscillator at a time. The contacts of 2K101 will short out one of the cathode resistors (2R174 or 2R179) to remove the high bias which prevents oscillation in that particular stage. Relay 2K101 affords the operator remote switching of the oscillators. Local switching is accomplished at the exciter with switch 2S103. The 117-volt crystal heater circuit includes fuses (2F101 and 2F102). Illumination of lamps (2I101 and 2I102) indicates when the heaters are energized. Lamps (2I103 and 2I104) indicate which oscillator is being used.

The output frequency of the oscillator is 1/12 that of the visual carrier frequency or $f_V/12$. Oscillations are maintained at a very low level to minimize internal heating of the crystal by R-F current. Better stability is obtained in this way.

Buffer amplifier (2V121) which follows the oscillator stage, drives frequency-multiplier stages (2V122 and 2V124) and visual amplifier (2V125). The power output from 2V125 is approximately 4 watts at visual carrier frequency.

Aural Section

The aural master oscillator (2V103) is of the Hartley type and is frequency-modualted by means of reactance tubes (2V101 and 2V102) which are connected across the oscillator plate tank (2T103-2C110-2C106). R-F from the oscillator tank is link-coupled to transformer (2T102) which has a coil in the grid circuit of each reactance tube. R-F voltages on the push-pull connected grids are 180° out of phase with each other and each is 90° out of phase with respect to the R-F voltage at the plates. Thus, across the oscillator tank circuit one tube appears as a capacitive reactance and the other as an inductive reactance.

The magnitude of the reactive plate current in 2V101 and 2V102 varies in direct proportion to the value of audio voltage applied to their grids, causing the frequency of the oscillator to be varied at an audio rate to furnish the required FM signal. By controlling the grid bias on 2V102, the average frequency of oscillator (2V103) is maintained at 1/12 of the

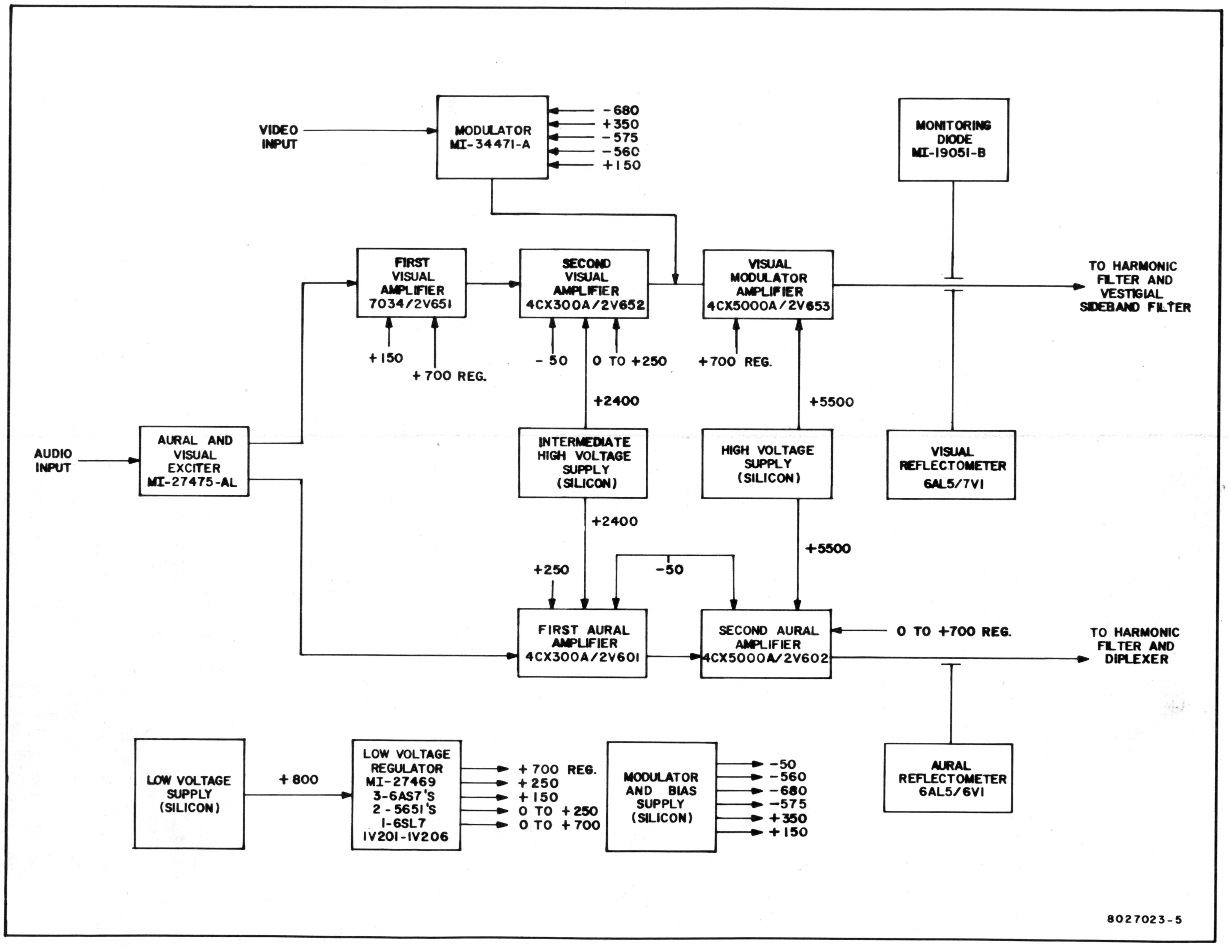

VIDEO INPUT
MODULATOR MI-34471-A
-680
+350
-575
-560
+150
MONITORING DIODE MI-19051-B
FIRST VISUAL AMPLIFIER 7034/2V651
SECOND VISUAL AMPLIFIER 4CX300A/2V652
VISUAL MODULATOR AMPLIFIER 4CX5000A/2V653
TO HARMONIC FILTER AND VESTIGIAL SIDEBAND FILTER
+150
+700 REG.
-50
0 TO +250
+700 REG.
+2400
+5500
AUDIO INPUT
AURAL AND VISUAL EXCITER MI-27475-AL
INTERMEDIATE HIGH VOLTAGE SUPPLY (SILICON)
HIGH VOLTAGE SUPPLY (SILICON)
VISUAL REFLECTOMETER 6AL5/7V1
+2400
+5500
+250
-50
FIRST AURAL AMPLIFIER 4CX300A/2V601
SECOND AURAL AMPLIFIER 4CX5000A/2V602
0 TO +700 REG.
TO HARMONIC FILTER AND DIPLEXER
LOW VOLTAGE SUPPLY (SILICON)
+800
LOW VOLTAGE REGULATOR MI-27469 3-6AS7'S 2-5651'S 1-6SL7 1V201-1V206
+700 REG.
+250
+150
0 TO +250
0 TO +700
MODULATOR AND BIAS SUPPLY (SILICON)
-50
-560
-680
-575
+350
+150
AURAL REFLECTOMETER 6AL5/6V1
8027023-5

Figure 3 - TT-6EL Transmitting Equipment Power Distribution/Signal Flow Block Diagram

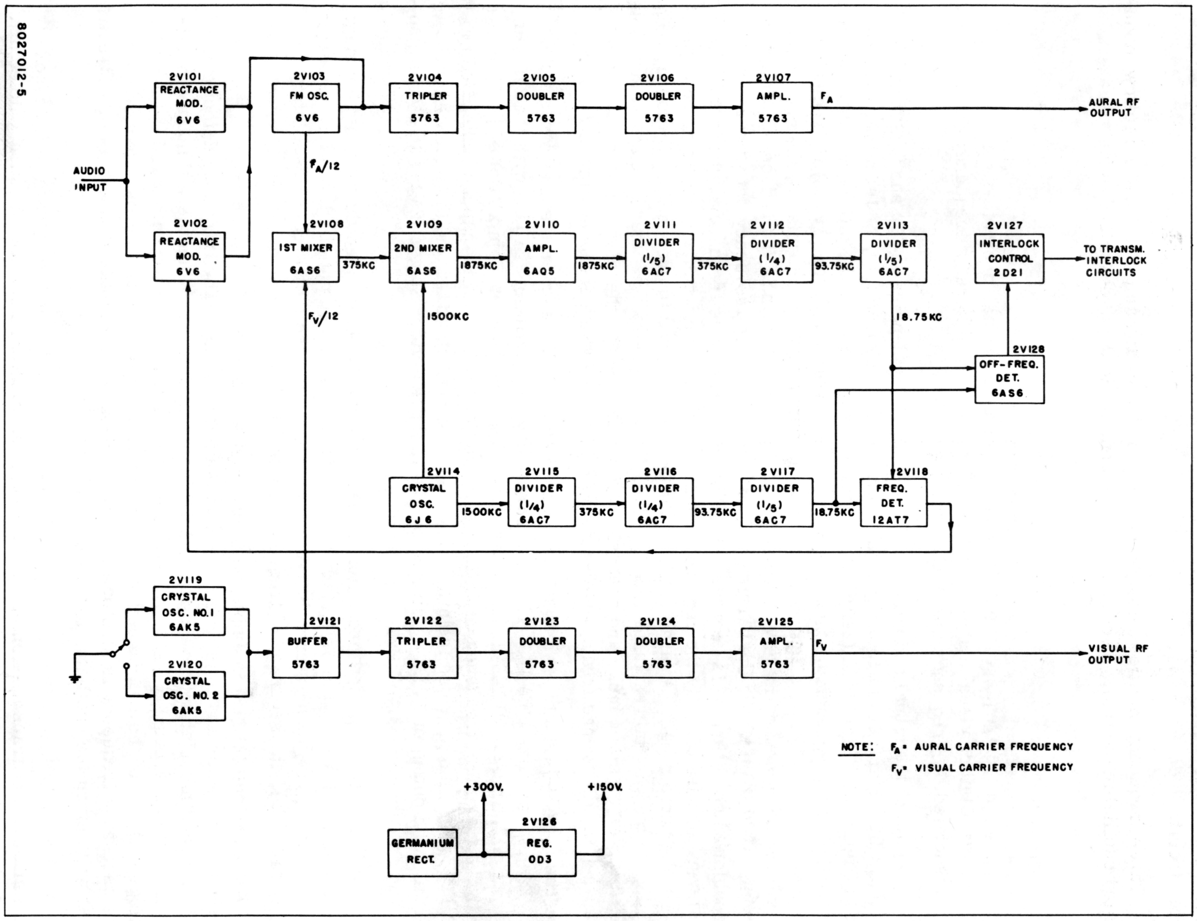

8027012-5
AUDIO INPUT
2V101 REACTANCE MOD. 6V6
2V102 REACTANCE MOD. 6V6
2V103 FM OSC. 6V6
2V104 TRIPLER 5763
2V105 DOUBLER 5763
2V106 DOUBLER 5763
2V107 AMPL. 5763
F_A
AURAL RF OUTPUT
$F_A/12$
2V108 1ST MIXER 6AS6
375KC
2V109 2ND MIXER 6AS6
1875KC
2V110 AMPL. 6AQ5
1875KC
2V111 DIVIDER (1/5) 6AC7
375KC
2V112 DIVIDER (1/4) 6AC7
93.75KC
2V113 DIVIDER (1/5) 6AC7
2V127 INTERLOCK CONTROL 2D21
TO TRANSM. INTERLOCK CIRCUITS
$F_V/12$
1500KC
18.75KC
2V128 OFF-FREQ. DET. 6AS6
2V114 CRYSTAL OSC. 6J6
1500KC
2V115 DIVIDER (1/4) 6AC7
375KC
2V116 DIVIDER (1/4) 6AC7
93.75KC
2V117 DIVIDER (1/5) 6AC7
18.75KC
2V118 FREQ. DET. 12AT7
2V119 CRYSTAL OSC. NO. 1 6AK5
2V120 CRYSTAL OSC. NO. 2 6AK5
2V121 BUFFER 5763
2V122 TRIPLER 5763
2V123 DOUBLER 5763
2V124 DOUBLER 5763
2V125 AMPL. 5763
F_V
VISUAL RF OUTPUT
NOTE: F_A = AURAL CARRIER FREQUENCY
F_V = VISUAL CARRIER FREQUENCY
+300V.
+150V.
GERMANIUM RECT.
2V126 REG. OD3

Figure 4 — Aural and Visual Exciter Block Diagram

aural carrier frequency (or $f_a/12$). Close control of the grid bias is affected through the afc circuit.

Three frequency-multiplier stages (2V104 to 2V106) and amplifier (2V107) follow modulated oscillator (2V103). These stages are identical to those described in the visual chain.

AFC Circuits

The automatic-frequency-control circuits include a crystal-controlled reference frequency oscillator, visual and aural difference frequency mixers, a frequency detector, and an associated off-frequency interlock control circuit.

Samples of the visual and aural oscillator output frequencies ($f_v/12$ and $f_a/12$) are fed through 2C228 and 2C114 to the first and third grids, respectively, of 1st mixer (2V108). (See Figure 31). Plate tank (2L109-2C153) is tuned to 375 kHz, the difference between the two oscillator frequencies. Since the signal from aural oscillator (2V103) is frequency modulated, the 375 kHz difference frequency is also frequency modulated, the maximum deviation being approximately ±2 kHz or 1/12 the carrier swing. To reduce this frequency swing to a degree where the carrier will not drop out at the frequency detector under any modulation condition, it is necessary to divide the difference frequency. If the 375 kHz signal were divided directly, the required number of times, the frequency at the detector would be in the audio range. A large filter would then be required to prevent this frequency from being fed back to the reactance tubes. Also, the components for tuned circuits at such low-frequencies would be bulky and expensive. It is necessary, therefore, to increase the ratio between the difference frequency component (375 kHz) and the frequency swing (±2 kHz).

The ratio between the two frequency components is increased in the 2nd mixer stage (2V109) which mixes the 1500 kHz signal from crystal oscillator (2V114) with the 375 kHz output of 1st mixer (2V108). The heterodyned frequency output from 2V109 is 1875 kHz, with the maximum frequency deviation remaining at ±2 kHz. This output is amplified in 2V110 which also provides isolation between the preceding mixer and the following divider chain. The output of 2V110 is divided by 100 in three divider stages (2V111 to 2V113) providing an output of 18.75 kHz.

The output from crystal oscillator (2V114) at 1500 kHz is carried through divider stages (2V115 to 2V117) with a division factor of 80, furnishing an output of 18.75 kHz. By using oscillator (2V114) as a reference frequency source and also a heterodyne oscillator for mixer (2V109), the accuracy of frequency control is increased many times.

A twin triode (2V118) is employed to provide two cathode follower stages to drive the frequency detector and to isolate it from the divider chains. The frequency detector is of the balanced modulator type using two 1N34A crystal diodes. When the FM master oscillator drifts off frequency, a dc voltage is developed at the detector output and fed back to the grid of one of the reactance tubes. The polarity of the voltage depends upon whether the oscillator frequency is high or low, and it changes the reactance tube bias in a direction that will return the oscillator to the correct frequency.

As noted previously, an off-frequency detector stage is used to actuate an interlock circuit and prevent transmission of an off-frequency aural carrier. Off-frequency detector (2V128) which mixes the 18.75 kHz signals from 2V113 and 2V117, has a plate circuit designed to bypass high frequencies. As long as the two 18.75 kHz input are identical, no heterodyne difference signal will be present on the plate. If a frequency change occurs at one of the inputs, the difference frequency potential at the plate circuit is rectified by crystal (2CR106) producing a positive dc voltage. This voltage is fed to the grid of interlock control thyratron (2V127) causing it to fire and energize relay (2K102). The contacts of 2K102 are connected in the transmitter interlock circuit and also in an alarm circuit, if desired. Opening of the interlock circuit removes plate voltages from the stages that follow the exciter.

Switch (2S102) permits selection of afc or manual control of the aural carrier frequency. In the event of a component failure in the afc circuits, the aural output frequency may be controlled manually by adjusting the front core of transformer (2T103).

Other Exciter Circuits

Either a 150 or 600 ohm audio input may be used with the exciter. Jumpers are used to connect the desired input impedance, as shown in Figure 31. A plug-in type pre-emphasis network (2Z101) follows the 150 and 600 ohm audio input connections.

Ten test jacks (2J105 to 2J114) are mounted on the exciter chassis to facilitate adjustments and servicing. These jacks provide an outlet for sampling the waveform of 1st mixer (2V108); 2nd mixer (2V109); amplifier (2V110); divider stages (2V111, 2V112, 2V113, 2V115, 2V116, and 2V117); and reference frequency oscillator (2V114).

An 11 position switch (2S101) and meter (2M101) permit a quick check on the operation and tuning of the R-F stages.

VISUAL MODULATOR

The video modulator accepts an input signal as low as 0.7 volt peak-to-peak and delivers a maximum output signal level of approximately 200 volts peak-to-peak. Linearity correction circuits compensate for non-linearity in the modulated amplifier and succeeding R-F stages. Motor-operated controls are incorporated which enable adjustments to be made from a remote point. Figure 5 is the modulator block diagram; Figure 32 is the modulator schematic diagram.

Video Circuits

The video amplifier stages consist of three video amplifiers, an inverter stage, a linearity corrector stage, and an output or modulator stage. The overall gain of these amplifiers is approximately 300.

The first video amplifier employs the pentode portion of a 6CX8 triode-pentode, followed by the triode section of the 6CX8, used as a polarity inverter. The linearity corrector stage and second video stage use 6CL6 pentodes. Two 5933 beam power tetrodes are used in the third video amplifier stage while the output or modulator stage employs seven 6146 beam power tubes. The grids of both the linearity corrector stage and the third video stage are clamped from a common keyed clamp circuit.

The output stage provides isolation between the relatively high impedance of the third video amplifier and the variable impedance of the modulated amplifier grid circuit. The input impedance of the modulated amplifier grid circuit is highly reactive. It consists of a capacitance of approximately 250 in parallel with a variable resistive component which

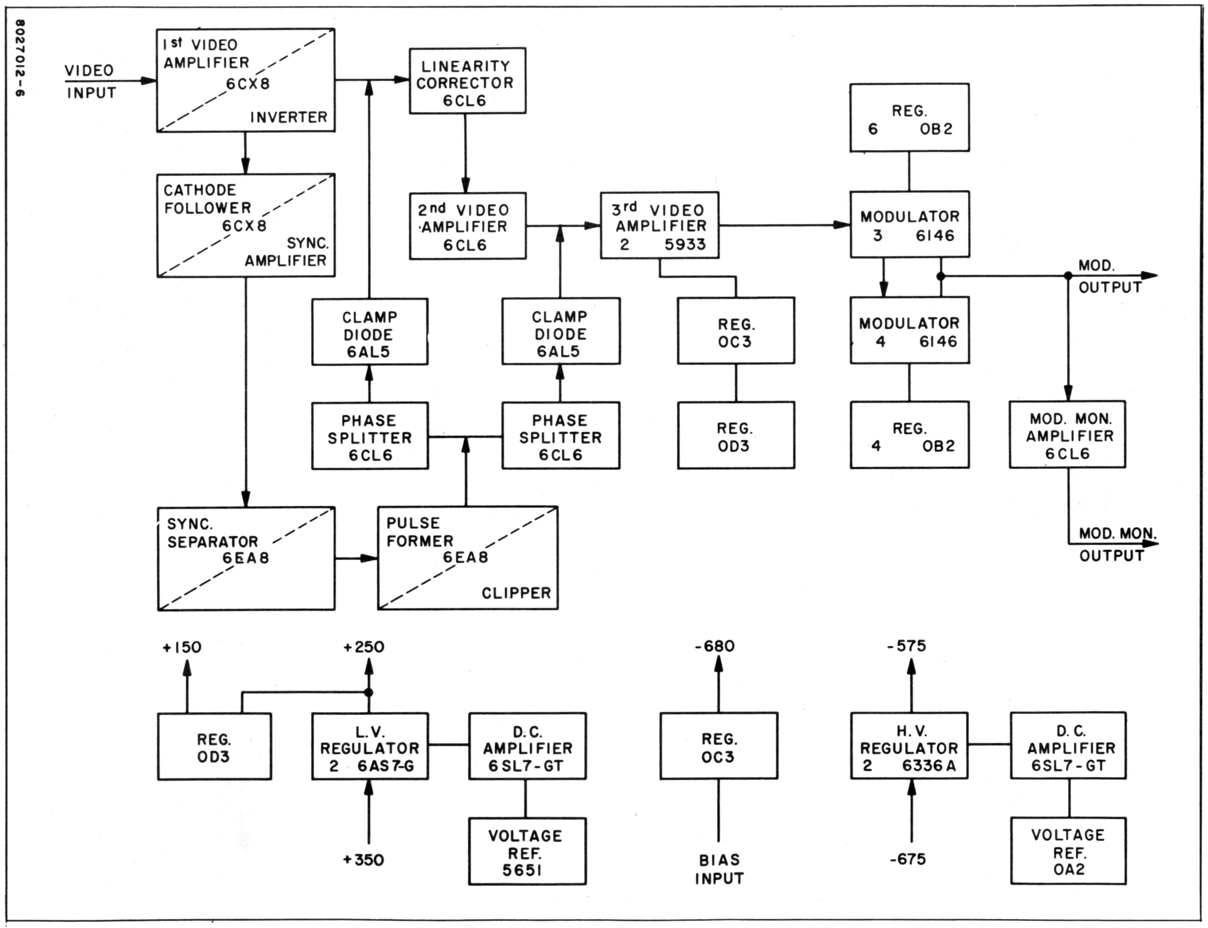

8027012-6
VIDEO INPUT
1st VIDEO AMPLIFIER 6CX8 INVERTER
LINEARITY CORRECTOR 6CL6
REG. 6 OB2
CATHODE FOLLOWER 6CX8 SYNC. AMPLIFIER
2nd VIDEO AMPLIFIER 6CL6
3rd VIDEO AMPLIFIER 2 5933
MODULATOR 3 6146
MOD. OUTPUT
CLAMP DIODE 6AL5
CLAMP DIODE 6AL5
REG. OC3
MODULATOR 4 6146
PHASE SPLITTER 6CL6
PHASE SPLITTER 6CL6
REG. OD3
REG. 4 OB2
MOD. MON. AMPLIFIER 6CL6
MOD. MON. OUTPUT
SYNC. SEPARATOR 6EA8
PULSE FORMER 6EA8 CLIPPER
+150
+250
-680
-575
REG. OD3
L.V. REGULATOR 2 6AS7-G
D.C. AMPLIFIER 6SL7-GT
REG. OC3
H.V. REGULATOR 2 6336A
D.C. AMPLIFIER 6SL7-GT
+350
VOLTAGE REF. 5651
BIAS INPUT
-675
VOLTAGE REF. OA2

Figure 5 — Visual Modulator Block Diagram

results from grid current flow. The output impedance of the modulator is so small that an impedance variation at the modulated amplifier grid will have a negligible effect on the modulator itself.

The first video amplifier (2V301A) is a voltage amplifier with a gain of approximately 4. Inverter stage (2V301B) and linearity corrector stage (2V302) are low-gain amplifiers, each having a gain near unity. The second video amplifier (2V304) has a gain of nearly 10 and supplies a signal of about 23 volts peak-to-peak to the grids of the third video amplifier. The third video amplifier (2V305 and 2V306) has a gain of approximately 10. The output stage (2V308 through 2V314) has a gain of unity. The modulator gain is sufficient to produce a 6 kW peak R-F power output from the modulated amplifier.

The amplitude versus frequency response of the modulator is flat within 1 dB to 5 MHz and the phase characteristic is satisfactory for the transmission of color video signals.

A high peaker circuit in the cathode of the first video stage (2V301A) provides an adjustable correction of the combined modulator, R-F, and antenna amplitude versus frequency response. This circuit also provides selective degeneration which, when reduced by the high peaker amplitude control, results in an increase of output at the resonant frequency of the network in the first video cathode circuit (approximately 4 MHz).

The cathode circuit of the third video amplifier includes a fixed circuit which corrects for a negative shift of the black level R-F power output by applying compensation in the positive direction at the output of the modulator. Normally, the keyed clamp circuit in the modulator will hold the pedestal level voltage constant for any video level or picture content. However, because a black picture corresponds to a higher average R-F power output, some loading of the power supply occurs. The tendency is for the R-F power output at the pedestal level to be slightly lower when transmitting a black picture than when transmitting a white picture. With a fixed percentage of sync, this would correspond to a reduction in peak power output. The compensating circuit samples a portion of the dc voltage across the degenerating resistor in the cathode of one of the three video amplifiers. This voltage is inversely proportional to the average R-F power output. The dc voltage has the high frequency video components filtered out and is applied to the pedestal level potentiometer. As a result, the bias on the modulated R-F amplifier is shifted in a positive (less negative) direction by an amount proportional to the average R-F power output. The peak R-F power output thereby remains nearly constant under all picture content conditions.

Clamp Circuits

The clamp circuit consists of two sync amplifiers (2V326A and 2V326B), a sync separator (2V327A), a clamp pulse former (2V328A), a clipper (2V328B), two phase splitters (2V329 and 2V330), and two clamp diodes (2V331 and 2V332).

The input signal to the clamp circuit is taken from the plate of inverter amplifier (2V301B) and coupled to the grid of sync cathode follower (2V326A). The output of 2V326A is coupled to the grid of sync amplifier (2V326B). The gain of the sync amplifier is controlled by cathode circuit potentiometer (2R443). This potentiometer is mechanically ganged to VIDEO GAIN CONTROL (2R301) in such a way that the sync gain is increased as the video level is lowered. By this means the signal level at the output of sync amplifier (2V326B) is made relatively constant even though the modulator video output voltage is varied over wide ranges.

The sync separator is conventional with adjust-clipping level. Its clipping level is adjusted by varying the screen voltage from the front panel of the modulator by means of the CLIPPER control. The polarity of the separated sync is negative at the plate of sync separator (2V327A).

The clamp pulse former (2V328A) includes in its plate circuit a critically damped resonant circuit, with a frequency of approximately 300 kHz. The separated sync is applied to the grid of this tube. Plate current cutoff allows a positive alternation to occur at the plate of 2V328A and because of the critical damping, only one-half alternation occurs. Following the trailing edge of sync, when 2V328A again goes into conduction, a negative going alternation appears at its plate.

The clipper stage (2V328B) reduces the amplitude of the positive alternation and inverts and amplifies the negative alternation generated by the trailing edge of sync.

The positive going alternation at the plate of 2V328B occurs during horizontal back porch and is fed into the grids of two phase splitter stages (2V329 and 2V330). Each of these stages employs identical resistors in its plate and cathode circuits. The positive alternation on the grids causes the plate current of each phase splitter tube to increase and develop equal amplitude but oppositely polarized plate and cathode pulses. These pulses are applied to clamp diodes (2V331 and 2V332).

The PEDESTAL LEVEL control is adjustable from the modulator front panel. This control varies the bias at the grids of the third video amplifier tubes by varying the reference voltage fed to the second clamp diode (2V332).

Included on the connection to each of the two clamped grids is a parallel inductor-resistor combination. This circuit provides a high impedance to the color subcarrier components and a low impedance to the clamp current component. The inductor is self-resonant at approximately the color subcarrier frequency (3.58 MHz). Any tendency toward shock excitation of the inductor is damped by the parallel resistor. This circuit allows clamping to occur in the presence of burst on the horizontal back porch without adversely affecting the amplitude or phase of the burst.

Modulator Stage

The modulator stage consists of seven 6146 tubes (2V308 through 2V314). Its mode of operation is somewhat unconventional. It is direct coupled and has a gain of unity.

Figure 6 is simplified schematic of the modulator in which 3 of the 6146 pentodes (2V308 to 2V310) are denoted by V1 and the other pentodes (2V311 to 2V314) are in series across the power supply.

For input dc level changes and for low-frequencies, the circuit operates as a cathode follower with a high value of cathode resistance (the plate resistance of pentode V2). Plate current flows throughout the entire cycle for these slow changes, that is, the circuit operates as a Class A amplifier.

For input signals with rapid rates of transition from one level to another, as in the case of square waves or high-frequencies, the circuit operation changes. For positive going transitions, V1 conducts heavily and charges the grid circuit capacitance of the modulated amplifier. This current flowing through 2R20 is applied to V2 and tends to cutoff V2.

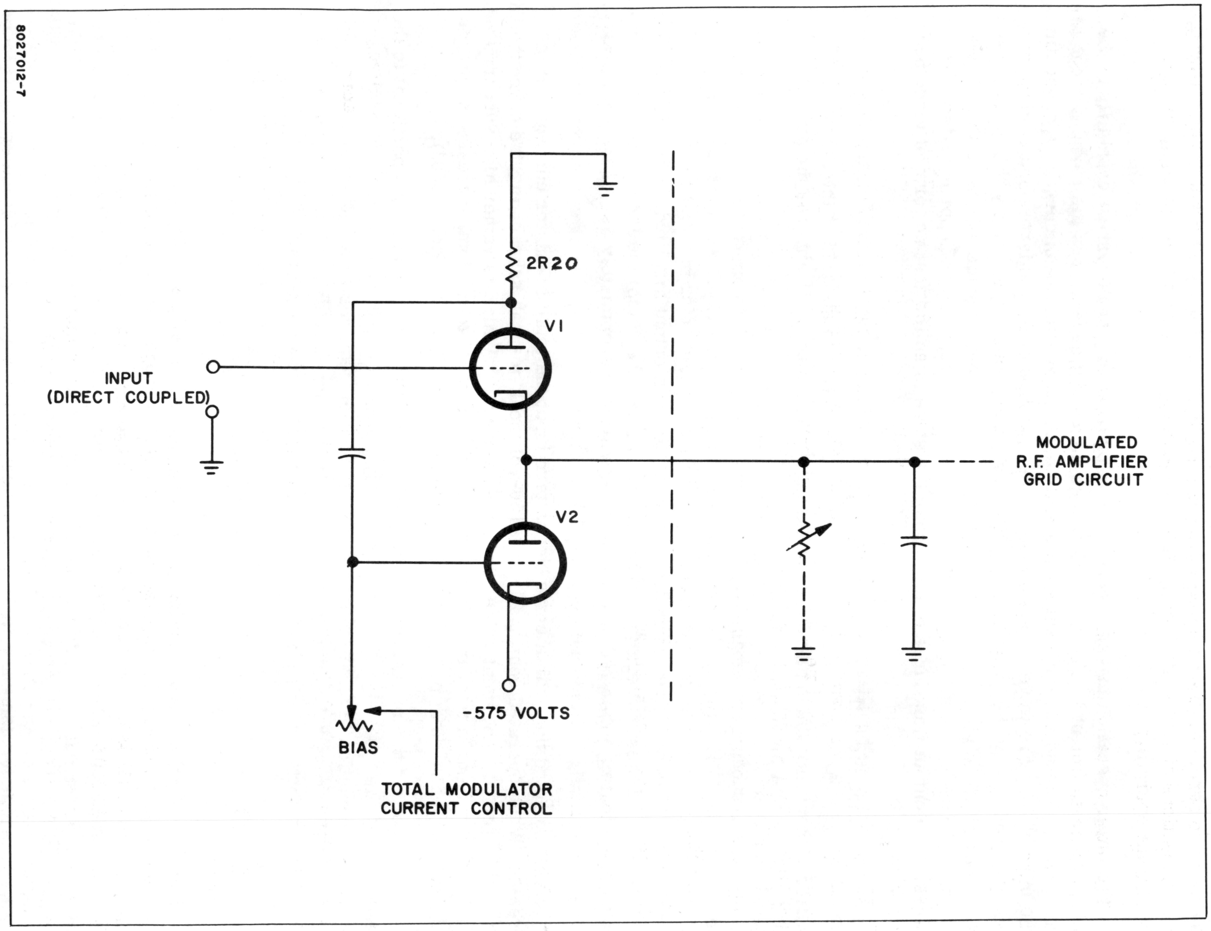

8027012-7
2R20
V1
INPUT
(DIRECT COUPLED)
V2
MODULATED
R.F. AMPLIFIER
GRID CIRCUIT
-575 VOLTS
BIAS
TOTAL MODULATOR
CURRENT CONTROL

Figure 6 — Modulator Output Stage Simplified Schematic

Conversely, negative going transitions tend to cutoff V1, which allows the bias on V2 to decrease to zero. V2 then conducts heavily and discharges the grid capacitance. During fast transitions of the input signal, plate current does not flow through a complete cycle, the circuit operating in a mode approaching Class B.

The latter operation makes it necessary to provide only peak current capability in the output stage sufficient to charge or discharge the capacitance across the modulator output. In a grid modulated stage operating at a 5 kW peak output, this peak current is approximately 750 mA for a square wave having a rise (or decay) time of 0.08 microsecond. Since the output impedance of the modulator is quite low, it is necessary to supply this peak current for only a short time. The total plate current for this output stage varies between 100 and 200 mA. The stage has a rated peak charging current capability of approximately 1.2 amperes. The output impedance of the modulator stage is so low that no form of video peaking is required.

By returning the cathode of V2 to the negative terminal of a regulated power supply, the output voltage range allows a directly coupled connection to the grid of the modulated amplifier without introducing a voltage offsetting arrangement. V1 absorbs the grid current of the 4CX5000A modulated amplifier.

The color subcarrier capability of theoutput stage, which is approximately 150 volts peak-to-peak, is limited by the peak current capability of V1. The amplitude of the color subcarrier corresponds to that occurring with a saturated color bar test pattern at 75% amplitude. This corresponds to 300-volt peak-to-peak output amplitude. In other words, with a color bar test pattern (assuming 25% sync, 7-1/2% setup) the largest amplitude color bar will be that of either red or cyan. These will be approximately 50% of the total peak excursion.

It will be noted that with a color bar pattern input the total modulator current will increase. When operated continually at a 150-volt peak-to-peak subcarrier, the current will increase from its quiescent value of 180 milliamperes. With this rather high subcarrier value the increase in total modulator current will be equal to the total increase in cathode current as measured at positions 7, 8, 9 and 10 of DC METER switch (2S301).

Note also that the amplitude capability of the modulator is inversely proportional to the frequency of the input signal. If the capability is exceeded, the modulator will be driven into grid conduction in an attempt to supply the power requirements. This does not represent a limitation with the energy distribution of any normal video signal, but it should be borne in mind when making point-to-point amplitude measurements.

AURAL R-F CIRCUITS

The aural R-F section contains two Class C amplifier stages. The exciter aural output is coupled to the first aural amplifier stage, (2V601) through a coaxial cable. The first R-F amplifier (2V601) is a type 4CX300A tetrode. The second aural R-F amplifier stage (2V602) is a type 4CX5000A tetrode. Potentiometer control of the screen voltage of 2V602 determines the power output. This voltage adjustment is accomplished by potentiometer (1R5) through motor (1B2) and AURAL EXCITATION switch (2S5).

A reflectometer using a type 6AL5 detector (6V1) in conjunction with meter (2M1) indicates the power and VSWR in the Aural output line.

VISUAL R-F CIRCUITS

The exciter visual output is coupled to the grid of the first visual amplifier (2V651) through a flexible coaxial cable. This Class C stage drives the second visual amplifier (2V652) which also operates Class C. Visual excitation control (1R3) varies the R-F excitation by controlling the screen-grid voltage of 2V652. This control is operated by motor (1B1) and VISUAL EXCITATION switch (2S6).

The output from 2V652 is coupled to modulated-amplifier stage (2V653) through capacitor (2C687). The visual modulator output is DC coupled to the grid of 2V653 through a tuned grid trap consisting of 2L659 and 2C680 which keeps R-F out of the modulator. Additional R-F filtering is provided by capacitors (2C682 and 2C683).

Swamping is employed in the plate circuit of the second visual amplifier to improve the regulation of this stage over the modulation cycle. Swamping load (11R1) is located on the switchgear panel. The amount of power dissipated in the swamping load is determined by the position of coupling loop (2L665) which is series resonated by variable capacitor (2C684).

A reflectometer using a type 6AL5 detector (7V1) indicates the power and VSWR in the modulated-amplifier output line. As shown in Figure 30 a monitoring diode is installed for checking the visual signal. The modulated-amplifier has a peak power output rating of 6000 watts.

POWER SUPPLIES

The high voltage power supply uses silicon diodes in a three-phase, full-wave rectifier circuit to provide 5500 volts dc for the plates of the 4CX5000A tubes.

The intermediate high voltage power supply also uses silicon diodes in a single-phase, bridge rectifier circuit. The intermediate high-voltage output produces 2400 volts dc for the plates of the two 4CX300A amplifier tubes.

The low voltage power supply uses silicon diodes in a single-phase, full-wave rectifier circuit. This circuit provides 800 volts dc which feeds the low voltage regulator.

Two single-phase, full-wave rectifier circuits, which also use silicon diodes, supply all the potentials needed for the visual modulator. The modulator low voltage supply provides a potential of 350 volts dc and the modulator high voltage supply provides a potential of -675 volts dc. This negative potential is also used as bias for the R-F stages. Bias for the modulator is obtained by adding a half-wave rectifier to the negative supply with its output in series with the -675 volts dc. Regulator circuits on the modulator chassis provide regulated potentials of 250 volts dc and -575 volts dc.

LOW VOLTAGE REGULATOR

Low Voltage Regulator MI-27469-A helps maintain the power output at a constant level during line voltage fluctuations. This regulator, shown in Figure 30 contains one 6SL7, three 6AS7, and two 5651 regulators. Switch (1S201) and meter (1M201) can be used to check voltages and currents at various points in the regulator circuits. The potential of 700 volts dc is supplied to the 1st visual amplifier plate and to the visual modulated-amplifier screen grid. The other screen voltages required in the R-F chains are also regulated by this unit.

LINE REGULATOR UNIT

Automatic regulation of the filament line voltage is provided by Line Regulator MI-27472 and Line Regulator Control Panel MI-27471, which control the filament voltage within two percent of the preset value. The modulator, exciter, bias, and low voltage supplies are also fed from the output of this regulator.

CARRIER-OFF MONITOR

The Carrier-off Monitor ES-27235-A (optional item) protects the transmitter from arcs, shorts, or loss of load and is recommended as a permanent equipment item. Additional details are presented in the carrier-off monitor instruction book.

4.75 MHz LOW PASS FILTER

The 4.75 MHz Low Pass Filter MI-27132-A serves as a 20 dB or more attenuator of the video input frequencies from 4.75 MHz and up. Not more than 1 dB of attenuation occurs in the frequency range from 0 to 4.2 MHz. A phase equalizer is included as part of the low pass filter to correct for the phase distortion caused by the sharp cutoff of the low pass filter.

HARMONIC FILTERS

Harmonic Filters MI-27317 are used to attenuate harmonic radiations from the output of the transmitter. Electrically, each filter consists of an M-derived half T-section, several low pass filter sections, and a constant K half T-section. The M-derived section provides both a rapid cutoff in the second harmonic region and a terminal impedance of 51.5 ohms at the opposite end of the unit. If required, gas-tight filters are available for outside installations.

VESTIGIAL SIDEBAND FILTER

The Vestigial Sideband Filter ES-27234 is completely assembled and adjusted for the specific channel of operation. This filter will attenuate the lower sideband output in accordance with FCC requirements. To minimize reflections on the transmission line between the visual transmitter and the filter, the filter visual input is designed to have a constant input impedance over the band of frequencies produced by the visual transmitter. The filter sections consist of lengths of coaxial line (resonant cavities) which are factory tuned to the channel stamped on the nameplate.

ADJUSTMENTS AND TUNING

Adjustment and tuning information is provided in the following paragraphs to ensure proper operation of the TT-6EL Transmitting Equipment. The information includes circuit and voltage checks, control settings,and overall transmitter tests for proper signal transmission. Table 6 lists the recommended test equipment which is required to properly adjust and tune the transmitting equipment.

ADJUSTMENTS

The adjustment procedures should be performed prior to tuning the transmitting equipment. Included is a transformer tap check, preliminary adjustments and settings control circuit check, tube filament voltage check and ventilating system adjustment.

NOTE: Ensure that all circuit breakers and pushbutton switches including the HIGH VOLTAGE ON and TRANSMITTER ON pushbutton switches on the TTC-5B Control Console (if one is installed), are in the OFF position before starting the adjustment procedures.

TRANSFORMER PRIMARY TAP CHECK

The transformer primary tap check is performed to ensure that proper connection is made to the transformers in the TT-6EL Transmitting Equipment. Check the transformer primary leads for connection to the proper taps as listed in Table 7.

PRELIMINARY ADJUSTMENTS AND CONTROL SETTINGS

Perform the following preliminary adjustments and control settings prior to performing control circuits check:

1. If a pre-emphasis is not desired in the transmitter, replace the pre-emphasis with an 18dB pad (Daven Company - Livingstone, New Jersey, catalog No. H-691 or equivalent).

2. Ensure that the proper connections have been made for audio input impedance, either 150 or 600 ohms, as shown on the aural and visual exciter schematic (see Figure 31).

3. Check the frequencies of the three oscillator crystals. The proper frequency for the two visual oscillator crystals (2Y101 and 2Y102) is given in the Crystal Frequency column of Table 8 for the assigned channel and mode of operation. The frequency of the reference crystal (2Y103) is 1500 kHz for all channels.

NOTE: The TT-6EL Transmitting Equipment frequency determining parts have been installed during factory adjustment and tuning for the channel specified by the customer. Therefore, no installation is required.

TABLE 6. RECOMMENDED TEST EQUIPMENT

Description	RCA Reference	Other Reference
Sideband Response Analyzer (BW-5B)	ES-34010-B	
Volt Ohmyst VTVM	WV-98C	
Oscilloscope (TO-524-AD)	MI-26500	
Distortion and Noise Meter (WM-71A)	MI-30071-A	
Plate Current Meter	MI-21200-C1	
Audio Oscillator (WM-28A)	MI-30028-A	
Envelope Delay Measuring Unit	BW-8A	
Square Wave Generator		Tektronix Model 105
Grid-dip Meter		Measurements Corp. Model 59
R-F Load and Wattmeter with a 1-5/8" to type N reducer (MI-19112-58) and a length of RG-8/U cable with type N fittings.		Bird Electronic Corp. Model 62
Reducer (see preceding item)	MI-19112-58	
20 Feet of RG-58/U Coaxial Cable		
AC Voltmeter 0-10 v, 0-300 v, 2%		
Crossover Filter Attachment for Oscilloscope	MI-34021*	
Linearity Checker (WA-7C*)	MI-34017-B	
Color Signal Analyzer	WA-6A* or	Tektronix Vectorscope*

*Items required to facilitate tuning for transmission of color signals.

TABLE 7. TRANSFORMER PRIMARY TAPS AND CONNECTIONS

Symbol	Line Voltage Range				
	197-205	206-215	216-225	226-235	236-245
1T1	CONNECT FOR 230 V PER TRANSFORMER NAMEPLATE				
1T201	-11 and 208	0 and 208	+11 and 208	0 and 230	+11 and 230
2T1, 2T4	-11 and 208	0 and 208	+11 and 208	-11 and 240	0 and 240
2T2, 2T5	-11 and 208 or 3 and 4	0 and 208 or 2 and 4	+11 and 208 or 1 and 4	-11 and 240 or 3 and 4	0 and 240 or 2 and 5
2T3	3 and 4	2 and 4	1 and 4	3 and 5	
2T114	3 and 5	2 and 5	1 and 5	2 and 6	1 and 6
2T115	3 and 5	2 and 5	1 and 5	2 and 6	1 and 6
2T301	3 and 4	2 and 4	1 and 4	2 and 5	1 and 5
2T302	3 and 4	2 and 4	1 and 4	2 and 5	1 and 5
2T303	3 and 4	2 and 4	1 and 4	2 and 5	1 and 5
4T1, 3T2	-11 and 208	0 and 208	+11 and 208	-11 and 208	0 and 240
4T1	-11 and 208	0 and 208	+11 and 208	-11 and 240	0 and 240
4T101	3 and 4	2 and 4	1 and 4	3 and 5	2 and 5
4T102	3 and 4	2 and 4	1 and 4	3 and 5	2 and 5
10T1*	3 and 4	2 and 4	1 and 4	3 and 5	2 and 5
10T2*	CONNECT FOR CLOSEST VOLTAGE PER TRANSFORMER NAMEPLATE				
12T1* 12T2* 12T3*	-11 and 208	0 and 208	+11 and 208	-11 and 240	0 and 240
Regulator Output	197	208	220	230	240

*Leave primaries disconnected until initial steps of tuning procedure have been completed.

CONTROL CIRCUITS CHECK

Before applying any power to the transmitter, the operator should review the general principles of control circuit operation for a better understanding of the overall function of the equipment. The control circuits in the TT-6EL transmitter contain the following features which provide maximum flexibility in control, protection, and operation:

1. Choice of single switch or step-by-step starting.
2. Automatic timing and sequencing for starting operations.
3. Provision for emergency by-passing of the plate time delay function.
4. Protection of the operator by a system of interlocks and grounding devices.
5. Protection of equipment by overload relays and circuit breakers.
6. Protection of the equipment against air failure.
7. Choice of single or multiple operation of overload circuits.
8. Location of transmitter faults by a system of indicators.

The control circuits, located at the left of the overall transmitter schematic (see Figure 30) are divided into two parts. They can be traced on the schematic diagram through CONTROL circuit breaker (1S1) and transformer (1T1). The control portion is usually called a control ladder diagram. As shown, the contactor coils appear in the control ladder portion of the overall schematic diagram, and their contacts appear in the main portion of the diagram. Similarly, the contacts of the overload relays appear on the control ladder section but their coils appear in the main portion of the diagram. Where practical, the coils and their associated contacts are connected by dotted lines. For the designation of a particular relay or switch function not otherwise identified, refer to the REPLACEMENT PARTS LIST.

The enclosure door, meter panel, and modulator chassis, which give access to circuits containing voltages above 350 volts, are provided with interlocks. When any interlock is opened, power is removed from the rectifier supplies and the high-voltage filter capacitors are automatically discharged by high-voltage grounding contactor (12K1). The low voltage and bias supplies are discharged through resistors. Opening of the interlocks does not remove power from the exciter, but exciter components carrying voltages above 300 volts are enclosed for safety. The interlocks and the grounding contactor should be carefully inspected and checked at regular intervals for proper operation. Never tamper with the interlocks.

Grounding sticks are provided and should be used to ground all high-voltage points before any components are touched. There is always the possibility that interlocks may become disabled, or that circuit breaker contacts may have become welded together because of high fault currents.

> NOTE: Before touching any component or circuit, make sure that the power to that component or circuit is off. Always use a grounding stick to guard against shock from accidental contact with dangerous potentials.

1. Check control and protective circuits for proper operation before applying plate and bias voltages. Any deviation from specified operation should be corrected before proceeding further.

2. Ensure that no transmitter tubes have been installed in their sockets. Where uninsulated filament, bias, or plate leads are used, ensure that none of these make contact with one another or with ground.

3. Remove all power from transmitting equipment.

4. Check for proper operation of the high voltage grounding contactors using a battery and buzzer, or an ohmmeter set to the low scale.

5. Ensure that the primary leads on transformers 10T1, 10T2, 12T1, 12T2, and 12T3 (refer to Table 7) are not connected. Tape ends of these leads to insulate them from ground and from each other.

6. Remove tape from edge of R-F compartment doors.

TABLE 8. CRYSTAL AND CARRIER FREQUENCIES

Assigned Channel	Visual Section		Aural Section
	Crystal Freq. (kHz)	Carrier Freq. (MHz)	Carrier Freq. (MHz)
NORMAL OPERATION:			
Channel 2	4604.166	55.25	59.75
Channel 3	5104.166	61.25	65.75
Channel 4	5604.166	67.25	71.75
Channel 5	6437.500	77.25	81.75
Channel 6	6937.500	83.25	87.75
OFFSET, 10 kHz LOW:			
Channel 2	4603.333	55.24	59.74
Channel 3	5103.333	61.24	65.74
Channel 4	5603.333	67.24	71.74
Channel 5	6436.666	74.24	81.74
Channel 6	6936.666	83.24	87.74
OFFSET, 10 kHz HIGH:			
Channel 2	4605.000	55.26	56.76
Channel 3	5105.000	61.26	65.76
Channel 4	5605.000	67.26	71.76
Channel 5	6438.333	77.26	82.76
Channel 6	6938.333	83.26	87.76

NOTE: Visual crystal frequency is 1/12 of visual carrier frequency. Refererence crystal frequency (2Y103) is 1500 kHz for all channels.

7. Lubricate Blower MI-34463 according to the instructions in the MAINTENANCE section before operating transmitter.

NOTE: When manually operating the plunger-type relays, remove the plastic cover, manipulate the plunger and observe that the toggle action of the contact mechanism is satisfactory.

8. Manually operate all relays and contactors to check for freedom of movement. Also, check for proper pole face alignment, cleanliness, contact alignment, and wiping action.

9. Connect a jumper temporarily between terminals (1E13 and 1E14) to bypass the air interlock. Remove blower leads from terminals (12E19, 12E20, and 12E21). Also, connect a jumper temporarily from 1E18 to 1E19 to bypass the modulated amplifier bias interlock.

10. Refer to the instruction book that was packed with the Line Regulator, MI-27472 to become familiar with the operation of the unit and its associated Line Regulator Control Panel, MI-27471. Ensure that the shipping screw and sponge rubber shipping pads have been removed from the voltage regulating relay in the control panel. Set the switches on the control panel as follows:

SWITCH	POSITION
CONTROL SELECTOR	MANUAL
CONTROL POWER	ON
MOTOR POWER	ON

11. Close external incoming line switch to apply 3-phase power to AC MAIN LINE circuit breaker (11S1) of the transmitter. Set AC MAIN LINE circuit breaker (11S1) to ON and observe that neon lamps (11I3 and 11I4) light.

12. Rotate LINE VOLTAGE selector switch (1S10) to LINE PHASE 1, LINE PHASE 2, and LINE PHASE 3 and observe reading across each line phase on LINE VOLTAGE meter (1M2).

13. Set AUXILIARY circuit breaker (11S2) to ON to apply power to Line Regulator MI-27472. Rotate LINE VOLTAGE selector switch (1S10) to REGULATED PHASE 1 and observe reading on LINE VOLTAGE meter (1M2).

14. Set CONTROL circuit breaker (1S1) to ON to apply power to the control ladder circuits and observe that TRANSMITTER OFF indicator lamp (1I4) and PLATE OFF indicator lamp (1I7) light.

15. Press TRANSMITTER ON/AIR ON pushbutton switch (1S13). TRANSMITTER OFF indicator lamp (1I4) will go off, TRANSMITTER ON/AIR ON indicator lamp (1I3), caution green lamp (12I1), and FILAMENT ON indicator lamp (1I2) light. Filament relay (1K2) and high voltage shorting contactor (12K1) energizes.

16. Press RAISE or LOWER switch on the Line Regulator Control Panel MI-27471 until reading on LINE VOLTAGE meter (1M2) agrees with value given in Table 7.

17. Remove cover from the voltage regulating relay on the Line Regulator Control Panel and adjust the large knurled nut until the contact pivot arm is horizontal and both sets of contacts are open.

18. Set CONTROL SELECTOR switch to AUTO. Rotate the LINE VOLTAGE selector switch (1S10) to REGULATED PHASE 2 and REGULATED PHASE 3 and observe reading on the LINE VOLTAGE meter (1M2).

19. Press and hold RAISE switch until regulator output voltage has increased approximately 5%; then release the control. The regulator should automatically return the output voltage to within 2% of the original value. Repeat this check by operating the LOWER switch for a 5% decrease in output voltages. Leave all controls on the regulator panel in their present position.

20. Close safety switch (11S3) and enclosure door. INTERLOCKS indicator lamp (1I1) lights, if the interlock circuit is complete.

21. Set FILAMENT switch (1S2) to ON; FILAMENT HOURS meter (1M4) operates and plate time delay relay (1K3) is energized. PLATE READY/T. D. BYPASS indicator lamp (1I5) lights after time delay relay (1K3) energizes (after a delay of 25 to 45 seconds).

22. Open each interlock (2S8, 2S10, and 11S6) to check interlock circuit and observe that INTERLOCKS (1I1) and PLATE READY/T. D. BYPASS (1I5) indicator lamps go off.

23. Press PLATE ON pushbutton switch (1S16); PLATE ON indicator lamp (1I6) lights and PLATE OFF indicator lamp (1I7) goes off. Modulator contactor (1K4) is energized and since the modulated bias interlock has been temporarily bypassed, bias and modulator auxiliary relay (1K5) energizes. The closed contacts of 1K5 energize plate contactor (11K1).

24. When plate contactor (11K1) energizes, Caution green lamp (12I1) goes off, red lamps (11I3 and 11I4) light, and low voltage contactor (1K6) is energized.

25. Set SINGLE TRIP/MULTIPLE TRIP switch (1S7) to SINGLE TRIP. Manually operate overload relays one by one ot check operation of overload circuits; press OVERLOAD O. L. RESET pushbutton switch 1S18 after operating each relay. Check plunger-type relays (1K10, 1K11, and 1K12) by operating each plunger to simulate a momentary overload. External covers must be removed from overload relays (1K13 through 1K22), all of which can be operated by pressing the armature with an insulated rod.

26. Observe that operating overload relays (1K10 through 1K22) or any other relays with contacts connected between terminals (1E67 and 1E68) energizes overload auxiliary relay (1K8) and notching relay (1K7). Contacts on relays (1K10 through 1K22) also energize associated overload light relays (1K31 through 1K46) which light indicator lamps 1I11 (A through P). Overload light relay and lamp remain energized through a holding contact until OVERLOAD/O. L. LIGHTS switch (1S9) is depressed.

27. When overload auxiliary relay (1K8) is energized, normally closed contacts will deenergize relays (1K4, 1K5, and 11K1). When notching relay (1K7) is energized, normally open contacts close lighting OVERLOAD/O. L. RESET indicator lamp (1I8) and energizing relay (1K47). Similarly, normally open contacts of 1K8 close to complete a circuit through the normally closed contacts of 1K9, holding relay 1K8 is energized after the overload has been removed to keep 1K4, 1K5 and 11K1 deenergized.

28. Notching relay (1K7) has two other sets of contacts which are opened or closed according to how many times coil of 1K7 has been energized. One set of contacts, in parallel with 1S7, follows the sequence of closed-open-open-open; that is, the contacts are normally closed until the first time 1K7 is energized, then stay open for the next two times 1K7 is energized. The other set of contacts in series with 1S7 is closed, remain closed for the next two times 1K7 is energized, but open the third time 1K7 is energized.

29. When 11K1 is deenergized, its normally closed contacts complete a circuit through contacts of 11K8 and 1K9 to energize overload time delay relay (1K9). After one second, contacts of 1K9 open deenergizing 1K8, 1K9 and notching relay 1K7. The circuit is then restored to the condition which existed before the overload occurred, except that 1K7 notched one step. Therefore, closed-open-open-open contacts in parallel with 1S7 open, and OVERLOAD/O. L. RESET indicator lamp (1I8) will light.

30. To restore transmitter circuit to preoverload condition, press OVERLOAD/O. L. RESET pushbutton switch (1S18) and OVERLOAD LIGHTS switch (1S9).

31. If the SINGLE TRIP/MULTIPLE TRIP switch (1S7) is set to the MULTIPLE TRIP position, the preceding sequence will take place when an overload occurs except that after the contacts of 1K8 reclose, bias and modulator contactor (1K4) will also reclose, since 1S7 is now shorting out the closed-open-open-open contacts, and the plate power will be restored. If the overload is not temporary or if it is repeated, the overload relay will reclose, repeating the overload cycle and advancing the notching relay another step. After

the third cycle, the closed-closed-closed-open contacts of 1K7 will be open preventing further recycling.

32. After all the circuits are operating normally, momentarily open and close FILAMENT switch (1S2) to check plate time-delay bypass circuit. If 1S2 is closed before the contacts of 1K3 open (within 1 to 5 seconds), plate power is not interrupted. If 1S2 is closed after contacts of 1K3 open, plate power is not restored until 1K3 closes (delay of 25 to 45 seconds).

33. In an emergency where conditions justify the probably reduction of tube cathode life, PLATE READY/T. D BYPASS pushbutton switch (1S15) may be pressed to shorten the filament heating cycle. Pushbutton 1S15 must be pressed and held until PLATE READY indicator (1I5) lights indicating 1K3 contacts have closed.

34. This completes the control circuit check. Remove all power from transmitting equipment.

35. Adjust overload relays (1K10 through 1K22) (refer to Table 9). To adjust small overload relays (1K13 through 1K22), it is necessary to use a dc supply which is adjustable from 0.5 to 1.5 volts and capable of delivering 3.5 amperes. An "A" battery, such as RCA Number VS069, with a series rheostat of from 5 to 10 ohms, will serve as such a supply. Adjust the supply for minimum voltage and connect it across the resistor shunting the relay to be adjusted. Connect an ammeter in series with the supply. Slowly increase the voltage to obtain the reading specified in Table 9. Adjust the relay spring tension so that it just pulls in at that current. Decrease and then increase the voltage several times to check for proper operation. Replace the relay covers after the relays have been adjusted.

TABLE 9. OVERLOAD RELAY SETTINGS

Relay	Shunt	Circuit	Settings
1K10*		Rectifier AC	5 A
1K11*		Rectifier AC	5 A
1K12*	12R7	High Voltage DC	12 A
1K13*	2R38	1st Aural Amplifier Cathode	.35 A
1K14	2R39	2nd Aural Amplifier Cathode	2.5 A
1K15	12R14	INT H. V. Rectifier DC	1 A
1K16	2R4	1st Visual Amplifier Cathode	0.25 A
1K17	2R11, 2R12	2nd Visual Amplifier Cathode	0.35 A
1K18	2R19	Visual Mod. Ampl. Cathode	2.0 A
1K19	12R9	Modulator Low Voltage	0.5 A
1K20		Not Used	
1K21	2R545	Modulator High Voltage	1.0 A
1K22	12R8	Low-Voltage Rectifier	1.2 A

*Use calibration on relay plunger.

TUBE FILAMENT VOLTAGES

1. Before any tubes are installed in the equipment, check filament voltages at the tube sockets using a voltmeter of known accuracy. To apply filament voltages, close AC MAIN LINE circuit breaker (11S1), AUXILIARY circuit breaker (11S2), CONTROL circuit breaker (1S1), TRANSMITTER ON/AIR ON pushbutton switch (1S13), FILAMENT switch (1S2), and EXCITER switch (1S4). The voltages should correspond closely to those listed in Table 10, but as the tubes are not in their sockets the voltages may be slightly higher.

TABLE 10. TUBE SOCKET FILAMENT VOLTAGES

Tube Socket	Tube Type	Socket Voltage	Measurement Point
EXCITER			
2XV101 to 2XV103	6V6	6.3±10% dc	pins 2-7
2XV104	5763	6.0±10% dc	pins 4-5
2XV105 to 2XV107	5763	6.0±10% ac	pins 4-5
2XV108 to 2XV109	6AS6	6.3±10% ac	pins 3-4
2XV110	6AQ5	6.3±10% ac	pins 3-4
2XV111, 2XV112	6AC7	6.3±10% ac	pins 2-7
2XV113	6AC7	6.3±10% dc	pins 2-7
2XV114	6J6	6.3±10% ac	pins 3-4
2XV115, 2XV116	6AC7	6.3±10% ac	pins 2-7
2XV117	6AC7	6.3±10% dc	pins 2-7
2XV118	12AT7	6.3±10% dc	pins 4-9, 5-9
2XV119, 2XV120	6AK5	6.3±19% ac	pins 3-4
2XV121 to 2XV125	5763	6.3±10% ac	pins 4-5
2XV127	2D21	6.3±10% ac	pins 3-4
2XV128	6AS6	6.3±10% ac	pins 3-4
MODULATOR			
2XV301	6CX8	6.3±10% ac	pin 5 - GND
2XV302, 2XV304	6CL6	6.3±10% ac	pin 5 - GND
2XV305, 2XV306	5963	6.3±10± ac	pins 2-7
2XV315	6CL6	6.3±10% ac	pin 5 - GND
2XV326	6CX8	6.3±10% ac	pin 5 - GND
2XV327, 2XV328	6EA8	6.3±10% ac	pin 5 - GND
2XV329, 2XV330	6CL6	6.3±10% ac	pin 5 - GND
2XV331, 2XV332	6AS7-G	6.3±10% ac	pins 3-4
2XV333, 2XV334	6AS7-G	6.3±10% ac	pins 7-8
2XV335	6SL7-GT	6.3±10% ac	pins 7-8
2XV338, 2XV339	6336-A	6.3±10% ac	pins 7-8
2XV340	6SL7-GT	6.3±10% ac	pins 7-8
CONTROL UNIT (LOW-VOLTAGE REGULATOR)			
1XV201	6SL7-GT	6.3±10% ac	pins 7-8
1XV204 to 1XV206	6AS7-G	6.3 ±10% ac	pins 7-8

TABLE 10. TUBE SOCKET FILAMENT VOLTAGES (Continued)

Tube Socket	Tube Type	Socket Voltage	Measurement Point
6 KW UNIT			
2XV1	2D21	6.3±10% ac	pins 3-4
2XV601	4CX300A	6.0±5% ac	2C615, 2C617
2XV602	4CX5000A	7.5±5% ac	2C608-2C609
2XV651	7034	6.0±5% ac	2C653-2C654
2XV652	4CX300A	6.0±5% ac	2C676-2C678
2XV653	4CX5000A	7.5±5% ac	2C663-2C664
VISUAL REFLECTOMETER			
6XV1	6AL5	6.3±10% ac	pins 3-4
AURAL REFLECTOMETER			
7XV1	6AL5	6.3±10% ac	pins 3-4

2. After all filament voltages have been checked, remove all power from transmitting equipment.

3. Remove test jumpers installed between terminals (1E13 and 1E14, and 1E18 and 1E19).

4. Connect blower leads on terminals (12E19, 12E20, and 12E21).

VENTILATING SYSTEM ADJUSTMENTS

1. Install all tubes. Note the primary leads should not be connected to transformers (10T1, 10T2, 12T1, 12T2, and 12T3) at this time.

2. Set controls to positions specified in Table 11.

TABLE 11. VENTILATING SYSTEM CONTROL SETTINGS

Control	Position
AC MAIN LINE circuit breaker (11S1)	ON
AUXILIARY circuit breaker (11S2)	ON
CONTROL switch (1S1)	ON
TRANSMITTER ON/AIR ON pushbutton switch (1S13)	Press (ON)

3. When AIR ON pushbutton switch 1S13 is pressed, blower motor starter (1K1) is energized and main blower motor (10B1) operates. Since the blower is operated from three-phase power, it is possible for the blower to rotate in the wrong direction. The blower should rotate counterclockwise when viewed from the impeller (scroll) end. If the direc-

tion of rotation is incorrect, open AC MAIN LINE circuit breaker (11S1) and interchange any two leads to blower. Close 11S1 and recheck the blower rotation.

4. Check air pressure readings on the two pressure gauges.

> NOTE: The minimum pressure is 2.5 inches at sea level. If the pressure is too low, readjust the blower sheaves as described in the preliminary Installation Instruction Book, IB-8027024-P. Higher pressures should be maintained at higher altitudes, as specified in Table 12.

TABLE 12. PRESSURE READINGS AT TRANSMITTER SITE ALTITUDES

Altitude Above Sea Level (Feet)	Maximum Air Temperature (°F)	Minimum Pressure Reading (Inches)
		6 kW Unit
0	113	2.5
1000	113	2.6
2000	113	2.7
3000	113	2.8
4000	111	2.9
5000	108	3.0
6000	104	3.1
7000	101	3.2
7500	99	3.3

TUNING

The tuning procedures for the TT-6EL Transmitting Equipment should be performed prior to the Transmitter Final Adjustments and Color Signal Adjustments. The tuning procedures included are for the aural and visual exciter, visual modulator, and the R-F circuits.

EXCITER

1. Energize 117-volt line supplying power to crystal heaters. After initial heating cycle, CRYSTAL HEATER INDICATORS lamps light intermittently as respective heaters are energized.

2. Remove type 2D21 tube (2V127) from tube socket. Set switches to positions indicated in Table 13 to energize exciter.

3. Adjust exciter visual R-F chain in order shown in Figure 14. Use an insulated alignment tool for adjustments and exciter meter 2M101 for tuning indications.

TABLE 13. EXCITER SWITCH SETTINGS

Control	Position
AC MAIN LINE circuit breaker (11S1)	ON
AUXILIARY circuit breaker (11S2)	ON
CONTROL switch (1S1)	ON
FILAMENT switch (1S2)	ON
EXCITER switch (1S4)	ON
AFC/MANUAL switch (2S102) (Exciter)	MANUAL
OVERLOAD circuit breaker (2S104) (Exciter)	ON
TRANSMITTER ON/AIR ON pushbutton switch (1S13)	Press (on)

TABLE 14. EXCITER TUNING, VISUAL R-F CHAIN

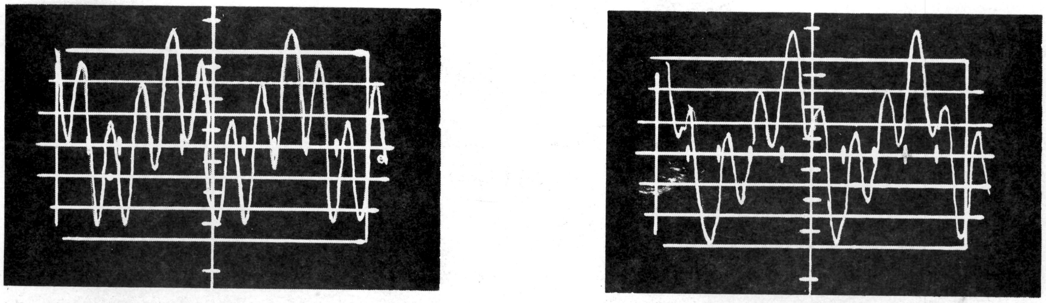
Setting of 2S101	Circuit	Adjust	Indication On 2M101
V122I_c	Plate, buffer 2V121	2L118	Maximum
V123I_c	Plate, tripler 2V122	2L119	Maximum
V124I_c	Plate, doubler 2V123	2L120	Maximum
V125I_c	Plate, doubler 2V124	2C242	Maximum
V125I_k	Plate, amplifier 2V125	2C248	Minimum

4. Rotate MULTIMETER selector switch (2S2) to position 9 (VIS AMPL GRID CURRENT). Adjust 1ST VISUAL AMPL INPUT LOADING control (2C666) and 1ST VISUAL AMPL INPUT TUNING control (2C667) for a maximum indication on MULTIMETER (2M4).

5. Adjust exciter VISUAL OUTPUT TUNING capacitor (2C246) in small increments, retuning exciter VIS AMPL PLATE TUNING capacitor (2C248) for each increment to obtain a maximum indication on 2M4. After adjusting 2C246 and 2C248 for maximum grid current, retune 2C666 and 2C667 for a maximum indication of at least 10 mA on MULTIMETER (2M4).

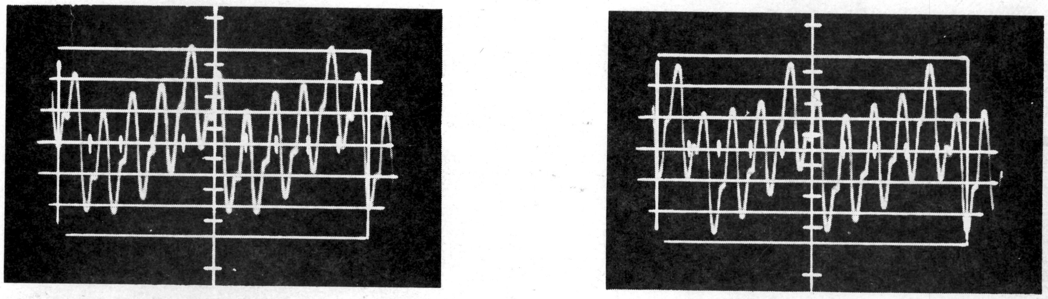
6. To adjust reference-frequency oscillator and divider stages, use an RCA type TO-524-AD oscilloscope with an attenuating probe. Connect oscilloscope and make tuning adjustments as given in Table 15. Refer to the waveforms of Figure 7 (A to E) for the correct oscilloscope presentations. Note that it is possible to have a divider adjusted so that, when only one cycle of the low frequency is observed, it appears to be dividing properly while actually it is dividing improperly on alternate cycles. (See Figure 7 (D).) To make certain it is dividing properly, several low frequency cycles should be observed.

7. Adjust master oscillator (2V103) so that it is operating at correct frequency to tune aural R-F chain.



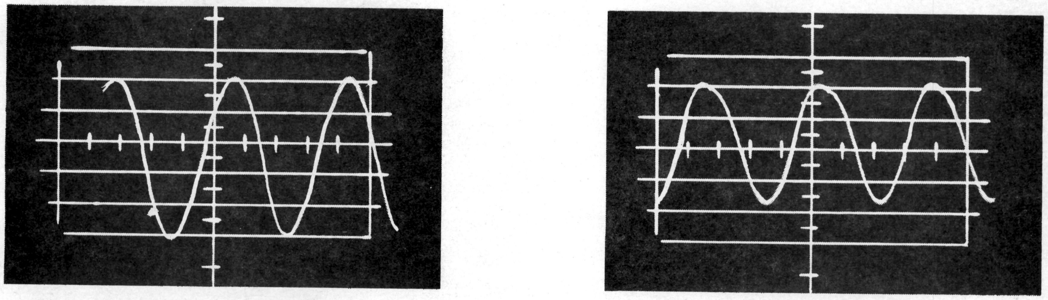
A. J111. First reference frequency divider;
15 volts peak to peak;
sweep rate, 1.0 microsecond/cm

B. J112. Second reference frequency divider;
20 volts peak to peak;
sweep rate, 3.5 microseconds/cm



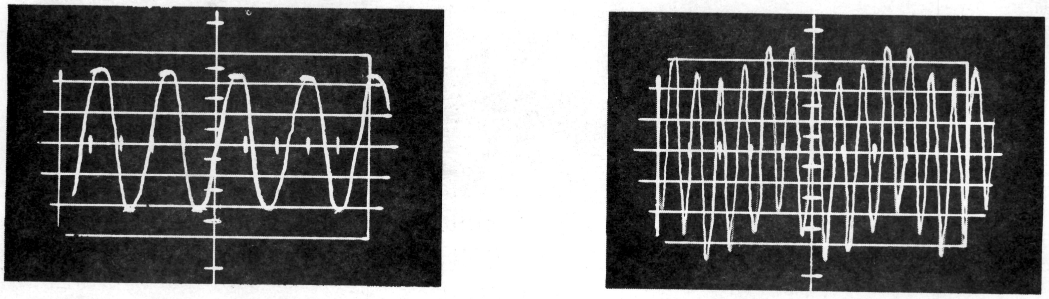
C. J113. Third reference frequency divider;
20 volts peak to peak;
sweep rate, 16 microseconds/cm

D. J113. Improper adjustment of T110;
20 volts peak to peak;
sweep rate, 16 microseconds/cm



E. J114. Reference frequency divider chain;
18.75-kc output; 100 volts peak to peak;
sweep rate, 16 microseconds/cm

F. J105. First mixer; 375-kc output;
10 volts peak to peak;
sweep rate, 1.0 microsecond/cm

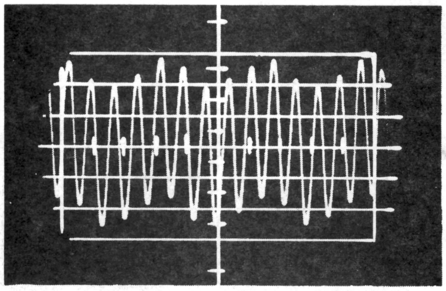


G. J106. Second mixer; 1875-kc output;
13 volts peak to peak;
sweep rate, 0.35 microsecond/cm

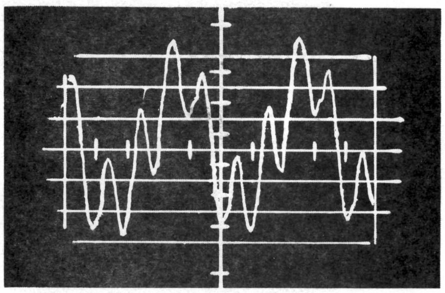
H. J107. First difference frequency divider;
30 volts peak to peak;
sweep rate, 1.0 microsecond/cm

8027012-8A

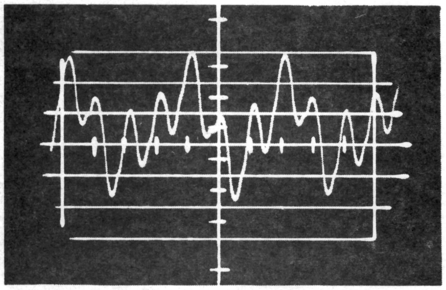
Figure 7 — Typical Exciter Waveforms (Sheet 1 of 2)



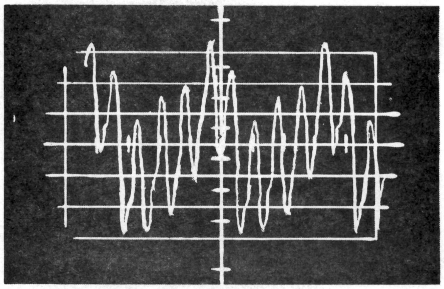
I. J107. Improper adjustment of T104;
30 volts peak to peak;
sweep rate, 1.0 microsecond/cm



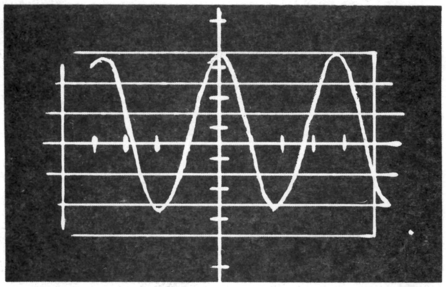
J. J108. Second difference frequency divider;
15 volts peak to peak;
sweep rate, 3.5 microseconds/cm



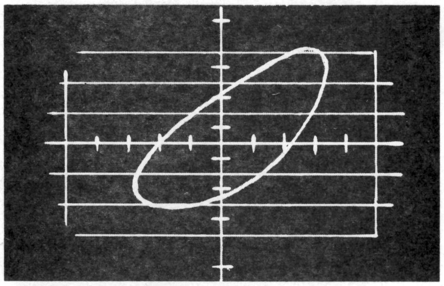
K. J108. Improper adjustment of T105;
15 volts peak to peak;
sweep rate, 3.5 microseconds/cm



L. J109. Third difference frequency divider;
15 volts peak to peak;
sweep rate, 16 microseconds/cm



M. J110. Difference frequency divider chain;
18.75-kc output; 120 volts peak to peak;
sweep rate, 16 microseconds/cm



N. J110. Horizontal input
J114. Vertical input
Stationary ellipse indicates AFC locked in

8027012-8B

Figure 7 — Typical Exciter Waveforms (Sheet 2 of 2)

NOTE: The core extending from the front of 2T103 is a fine frequency adjustment and should be backed off six to eight turns from its maximum clockwise position. The coarse frequency setting should then be made by adjustment of the core extending from the rear of 2T103. The correct frequency of the master oscillator is 375 kHz above the visual crystal frequency. It should be adjusted as close as possible to this frequency with the use of a wavemeter or calibrated receiver. Then adjust the aural R-F chain in the order shown in Table 16.

8. Adjust mixers and difference-frequency dividers as indicated in Table 17 using TO-524-AD oscilloscope with attenuating probe. Refer to the waveforms in Figure 7 (F to M) for correct oscilloscope presentations.

9. After completing AFC adjustments, recheck aural R-F chain tuning according to Table 16.

10. Rotate MULTIMETER selector switch (2S2) to position 1 (1ST AUR AMPL GRID CURRENT). Adjust AURAL AMPL INPUT LOADING control (2C611) and 1ST AURAL AMPL INPUT TUNING control (2C612) for a maximum indication on MULTIMETER (2M4).

11. Adjust exciter AURAL OUTPUT TUNING capacitor (2C138) in small increments, readjusting exciter AURAL AMPL PLATE TUNING capacitor (2C140) each time for a maximum indication on 2M4. After adjusting 2C138 and 2C140 for maximum grid current, retune 2C611 and 2C612 for maximum indication of at least 10 mA on MULTIMETER (2M4).

12. Connect oscilloscope horizontal input to jack (2J114) after completing adjustments. If adjustments have been made properly, a rotating ellipse pattern should appear on oscilloscope (See Figure 7 (N).) The speed of rotation of pattern is dependent upon the frequency difference between the reference-frequency divider output (2V117) and the difference-frequency divider output (2V113). This difference should be slight.

13. Adjust front core of 2T103 until ellipse is as nearly stationary as possible. Set AFC/MANUAL switch (2S102) to AFC; ellipse pattern should cease to rotate, indicating that aural master oscillator is locked on correct frequency.

14. Rotate DC selector switch (2S101) to AFC setting. A zero reading on meter (2M101) indicates that the master oscillator (2V103) is on frequency and that no correction voltage is present. To check AFC operation, rotate core of 2T103 clockwise and then counterclockwise. A positive or negative voltage should be obtained on 2M101, depending on the direction of core rotation. Restore the core of 2T103 to its proper setting, again obtaining a zero reading on 2M101.

NOTE: For the following final adjustments on the exciter, the unit should have been in operation for at least 30 minutes.

TABLE 15. EXCITER TUNING, REFERENCE FREQUENCY OSCILLATOR AND DIVIDERS

Connect Oscilloscope to	*Circuit*	*Adjust*	*Sweep Time*	*Oscilloscope Indication*	*Remarks*
2J111	Plate, osc. 2V114	2L112	1.0 μsec/cm.	75% of max.	Remove 2V115 before tuning. Turn screw of 2L112 counterclockwise from max. Replace 2V115 after adjustment.
2J111	Plate, divider 2V115	2T108	1.0 μsec/cm.	Divide by 4	
2J112	Plate, divider 2V116	2T109	3.5 μsec/cm.	Divide by 4	
2J113	Plate, divider 2V117	2T110	16 μsec/cm.	Divide by 5	
2J114	Output, divider 2V117	2T111	16 μsec/cm.	Max. amplitude	

TABLE 16. EXCITER TUNING, AURAL RF CHAIN

Setting of 2S101	*Circuit*	*Adjust*	*Indication on 2M101*	*Remarks*
V101 and V102 I_k	Grid, reactance mod. 2V101-2V102	2C103	Maximum	This adjustment should also produce max. modulation sensitivity, and can be made more precisely during final tuning using audio tone modulation.
V105 I_c	Plate, tripler 2V104	2L103	Maximum	
V106 I_c	Plate, doubler 2V105	2L104	Maximum	
V107 I_c	Plate, doubler 2V106	2C132	Maximum	
V107 I_k	Plate, amplifier 2V107	2C140	Minimum	

TABLE 17. EXCITER TUNING, MIXERS AND DIFFERENCE-FREQUENCY DIVIDERS

Connect Oscillo-scope to	*Circuit*	*Adjust*	*Sweep Time*	*Oscilloscope Indication*	*Remarks*
2J105	Output, 1st mixer 2V108	2L109	1.0 μsec/cm.	Max. amplitude	See Note 1
2J106	Output, 2nd mixer 2V109	2L110	0.35 μsec/cm.	Max. amplitude	CAUTION—See Note 2
2J107	Plate, amplifier 2V110	2L111	1.0 μsec/cm.	Max. amplitude	Remove 2V111
2J107	Plate, divider 2V111	2T104	1.0 μsec/cm.	Divide by 5	Replace 2V111
2J108	Plate, divider 2V112	2T105	3.5 μsec/cm.	Divide by 4	
2J109	Plate, divider 2V113	2T106	16 μsec/cm.	Divide by 5	
2J110	Output, divider 2V113	2T107	16 μsec/cm.	Max. amplitude	

NOTE 1: Before proceeding with the remaining adjustments, the master oscillator frequency should be checked to make sure it is very close to the correct frequency. This can be done by comparing the output frequencies of 1st mixer 2V108 and divider 2V115, both of which should be 375 kc. To compare these two frequencies, connect the vertical input of the oscilloscope to 2J105 and the external sweep input to 2J112. Remove 2V116. Adjust the core extending from the rear of 2T103 for a nearly stationary ellipse on the oscilloscope. Replace 2V116 and disconnect the external sweep from the oscilloscope.

NOTE 2: The output frequency of the 2nd mixer is 1875 kc, which is the sum of the reference oscillator and the 1st mixer output frequencies (1500 kc and 375 kc). To be certain that the 2nd mixer plate circuit is tuned to 1875 kc rather than 1500 kc, check that the signal at 2J106 disappears when the 375 kc is removed. The 375 kc signal can be removed by removing 2V103 (master oscillator), 2V108 (1st mixer), or the visual crystal.

15. Connect vertical and horizontal inputs of the oscilloscope to jacks (2J110 and 2J114), and observe an ellipse pattern.

16. Turn core of 2L110 slowly clockwise until oscilloscope pattern just begins to rotate. Then turn core slowly counterclockwise, counting number of turns through the stationary point to the position where the pattern again starts to rotate. Turn core clockwise one-half number of turns just determined.

17. Repeat above procedure with cores of 2T109, 2T108, 2T106, 2T105, and 2T104 in order given. This adjusts various cores to their optimum setting. For reference, frequencies encountered throughout exciter are listed in Table 18.

18. After completing preceding adjustments, set EXCITER switch (1S4) to OFF position.

VISUAL MODULATOR - INITIAL ADJUSTMENTS

1. Connect primaries of transformers 12T2 and 12T3.

2. Set modulator controls to following positions:

Control	Position
VIDEO GAIN (2R301)	0 (max. counterclockwise)
CLIPPER (2R455)	2
COUPLING (2S303)	AC
HI-SPEAKER AMP (2R310)	Max. counterclockwise
TOTAL MOD. CURRENT (2R492)	9
PEDESTAL LEVEL (2R488)	Max. clockwise
LINEARITY CORRECTOR (2S304)	Off
LINEARITY A (2R558)	0
LINEARITY B (2R559)	0
LINEARITY C (2R560)	0
LINEARITY D (2R561)	0

3. Remove tubes (2V311, 2V312, 2V313, and 2V314) from modulator stage.

4. Set switches to following positions to energize modulator:

Control	Position
AC MAIN LINE circuit breaker (11S1)	ON
AUXILIARY circuit breaker (11S2)	ON
CONTROL switch (1S1)	ON
FILAMENT switch (1S2)	ON
TRANSMITTER ON/AIR ON pushbutton switch (1S13)	Press (On)
PLATE ON pushbutton switch (1S16)	Press (On)
MODULATOR switch (1S6)	ON

5. Check the voltages supplied from modulator rectifiers as follows:

TABLE 18. EXCITER FREQUENCIES (EACH STAGE)

Stage			Input		Output	
Designation	Name	Tube Type	Frequency	Measured At	Frequency	Measured At
2V101	Reactance Modulator	6V6	Audio	pin 5	Audio	pin 3
2V102	Reactance Modulator	6V6	Audio	pin 5	Audio	pin 3
2V103	Master Oscillator	6V6	$F_a/12$	pin 5	$F_a/12$	pin 3
2V104	Tripler	5763	$F_a/12$	pins 8 and 9	$F_a/4$	pin 1
2V105	Doubler	5763	$F_a/4$	pins 8 and 9	$F_a/2$	pin 1
2V106	Doubler	5763	$F_a/2$	pins 8 and 9	F_a	pin 1
2V107	Amplifier	5763	F_a	pins 8 and 9	F_a	pin 1
2V108	1st Mixer	6AS6	$F_a/12$ and F/12	pin 7 and pin 1	$F_a/12$ minus $F_v/12$ = 375 kHz	pin 5
2V109	2nd Mixer	6AS6	375 kHz and 1,500 kHz	pin 1 and pin 7	1,875 kHz	pin 5
2V110	Amplifier	6AQ5	1,875 kHz	pins 1 and 7	1,875 kHz	pin 5
2V111	Divider (1/5)	6AC7	1,875 kHz	pin 4	375 kHz	pin 8
2V112	Divider (1/4)	6AC7	375 kHz	pin 4	93.75 kHz	pin 8
2V113	Divider (1/5)	6AC7	93.75 kHz	pin 4	18.75 kHz	pin 8
2V114	Crystal Oscillator	6J6	1,500 kHz	pin 5	1,500 kHz	pins 1 and 2
2V115	Divider (1/4)	6AC7	1,500 kHz	pin 4	375 kHz	pin 8
2V116	Divider (1/4)	6AC7	375 kHz	pin 4	93.75 kHz	pin 8
2V117	Divider (1/5)	6AC7	93.75 kHz	pin 4	18.75 kHz	pin 8
2V118	Frequency Determining Drive (Cathode Follower)	12AT7	18.75 kHz and 18.75 kHz	pin 7 and pin 2	18.75 kHz	pins 3 and 8
2V119	Visual Oscillator	6AK5	$F_v/12$	pin 1	$F_v/12$	pin 5
2V120	Visual Oscillator	6AK5	$F_v/12$	pin 1	$F_v/12$	pin 5
2V121	Buffer	5763	$F_v/12$	pins 8 and 9	$F_v/12$	pin 1
2V122	Tripler	5763	$F_v/12$	pins 8 and 9	$F_v/4$	pin 1
2V123	Doubler	5763	$F_v/4$	pins 8 and 9	$F_v/2$	pin 1
2V124	Doubler	5763	$F_v/2$	pins 8 and 9	F_v	pin 1
2V125	Amplifier	5763	F_v	pins 8 and 9	F_v	pin 1
2V126	Regulator	OD3	-	-	-	-
2V127	Interlock Control	2D21	-	-	-	-
2V108	Off-Frequency Detector	6AS6	18.75 kHz and 18.75 kHz	pin 7 and pin 1	Diff. freq. (normally zero)	pin 5

F_a = Aural carrier frequency: F_v = Visual carrier frequency.

NOTE: Refer to Table 8 for carrier frequencies.

a. Measure +150 volts at pin 2 of 2XV338 to check unregulated voltage applied to plates of high voltage regulator tubes (2V338 and 2V339).

b. Measure +350 volts at pin 2 of 2XV333 to check unregulated voltage applied to plates of low voltage regulator tubes (2V333 and 2V334).

6. Adjust HV ADJ control (2R542) until output of high voltage regulator reaches -575 volts. Adjust LV ADJ control (2R519) until output of low voltage regulator reaches +250 volts. Check readings on DC METER (2M301) for proper values listed in Table 19, allowing for tubes 2V311, 2V312, 2V313, and 2V314 being removed.

7. Check range of PEDESTAL LEVEL control. In 3RD VIDEO L Ik or 3RD VIDEO R Ik positions of 2S301, current should vary from 70 mA to approximately 125 mA per tube. Adjust PEDESTAL LEVEL control for approximately 75 mA through each 3rd video amplifier tube (2V305 and 2V306).

8. Set TOTAL MOD. CURRENT control (2R492) to maximum counterclockwise position to apply a relatively high bias to grid terminals of sockets 2XV311, 2XV312, 2XV313, and 2XV314.

9. Remove all power from transmitting equipment. Install 2V314 (nearest chassis) in the modulator stage and place plate connector on the plate cap. Reapply power.

10. Set DC METER selector switch (2S301) to position corresponding to modulator tube replaced; DC METER (2M301) should be less than 50 mA.

11. Remove all power from transmitting equipment; repeat steps 9 and 10 for tubes 2V313, 2V312, and 2V311.

12. Adjust PEDESTAL LEVEL control to maximum clockwise position. Vary TOTAL MOD. CURRENT control (2R492) until underbias relay (2K301) energizes. This relay must energize at voltages between 170 and 180 volts and must not deenergize at voltages greater than 150 volts as indicated on the MOD. AMPL. BIAS meter (2M5). Normal value for 2R432 is 220 K ohms; if necessary, substitute a different value for proper operation.

13. Adjust PEDESTAL LEVEL control until MOD. AMPL. BIAS meter (2M5) indicates 200 volts. Adjust TOTAL MOD. CURRENT control (2R492) for and indication of 180 mA on the TOTAL MOD. CURRENT meter (2M302).

14. Set COUPLING switch (2S303) to DC. Modulator is now ready for operation with a composite signal. As there is a slight change in MOD AMPL. BIAS meter reading from a no-signal condition to a black picture condition, final reading of MOD AMPL. BIAS meter (200 volts) should be made with a black picture input signal.

15. This completes the initial adjustments of the modulator. Remove all power from transmitting equipment before continuing with the tuning procedure.

R-F TUNING

1. Before applying power to the R-F stages, perform the following procedures which will remove plate and screen voltages from all stages except the first aural amplifier.

a. Remove resistors 12R1 and 12R2 (visual modulated-amplifier plate voltage).

TABLE 19. TYPICAL METER PANEL INDICATIONS

Meter Nomenclature	Switch and Position	Meter Indications			
		No Variation With Modulation	White Picture (25% Sync),	Mid-Characteristic (No Modulation)	Black Picture (25% Sync)
		CONTROL UNIT			
LOW VOLTAGE (1M1)	--	0.8 KV			
LINE VOLTAGE (1M2)	LINE - (1S10)				
	PHASE 1	208/240 ±5%			
	PHASE 2	208/240 ±5%			
	PHASE 3	208/240 ±5%			
	REGULATED -				
	PHASE 1	See Table 7			
	PHASE 2	See Table 7			
	PHASE 3	See Table 7			
PLATE VOLTAGE (1M3)	--	5.5 KV			
		CONTROL UNIT (LOW VOLTAGE REGULATOR)			
METER (1M201)	METER SELECTOR - OFF				
	E O 0-1000 V	700 V			
	E IN-E O 0-300 V	100 V			
	V204A 0-100 MA	75 mA			

TABLE 19. TYPICAL METER PANEL INDICATIONS (CONTINUED)

Meter Nomenclature	Switch and Position	Meter Indication			
		No Variation With Modulation	White Picture (25% Sync)	Mid-Characteristic (No Modulation)	Black Picture (25% Sync)
METER (1M201) (Continued)	V204B 0-100 MA	75 mA			
	V205A 0-100 MA	75 mA			
	V205B 0-100 MA	75 mA			
	V206A 0-100 MA	75 mA			
	V206B 0-100 MA	75 mA			
6 KW DRIVER UNIT					
AURAL RE-FLECTOMETER (2M1)	PWR (2S1)	100%			
	VSWR	1.05 - 1.3			
	VSWR CAL	100%			
2ND AUR PLATE (2M2)	--	0.78 amp.			
INTERMEDIATE HV (2M3)	--	2.7 KV			
MULTIMETER (2M4)	Selector Switch (2S2)				
	1 - 1ST AUR AMPL GRID CURRENT	5 mA			

TABLE 19. TYPICAL METER PANEL INDICATIONS (CONTINUED)

Meter Nomenclature	Switch and Position	Meter Indications			
		No Variation With Modulation	White Picture (25% Sync)	Mid-Characteristic (No Modulation)	Black Picture (25% Sync)
MULTIMETER (2M4) (Continued)	2 - 1ST AUR AMPL CATHODE CURRENT	85 mA			
	3 - 1ST AUR AMPL SCREEN CURRENT	7 mA			
	4 - 1ST AUR AMPL SCREEN VOLTAGE	160 V			
	5 - 2ND AUR AMPL GRID CURRENT	40 mA			
	6 - 2ND AUR AMPL SCREEN CURRENT	75 mA			
	7 - 2ND AUR AMPL SCREEN VOLTAGE	280 V			
	8 - OFF				
	9 - 1ST VIS AMPL GRID CURRENT	10 mA			

TABLE 19. TYPICAL METER PANEL INDICATIONS (CONTINUED)

Meter Nomenclature	Switch and Position	Meter Indication			
		No Variation With Modulation	White Picture (25% Sync)	Mid-Characteristic (No Modulation)	Black Picture (25% Sync)
MULTIMETER (2M4) (Continued)	10 - 1ST VIS AMPL CATHODE CURRENT	100 mA			
	11 - 2ND VIS AMPL GRID CURRENT	5 mA			
	12 - 2ND VIS AMPL CATHODE CURRENT	0.23 amp.			
	13 - 2ND VIS AMPL SCREEN CURRENT	15 mA			
	14 - 2ND VIS AMPL SCREEN VOLTAGE	250 V			
	15 - VIS MOD AMPL SCREEN CURRENT		0	8 mA	20 mA
	16 - VIS MOD AMPL SCREEN VOLTAGE	700 V			

TABLE 19. TYPICAL METER PANEL INDICATIONS (CONTINUED)

Meter Nomenclature	Switch and Position	Meter Indications			
		No Variation With Modulation	White Picture (25% Sync)	Mid-Characteristic (No Modulation)	Black Picture (25% Sync)
MULTIMETER (2M4) (Continued)	17 - OFF				
	18 - SWAMPING	50			
	19 - GRID TRAP TUNING INDICATOR	0-15			
	20 - OFF				
MOD AMPL BIAS (2M5)	--		310 V	260 V	200 V
MOD AMPL PLATE (2M6)			0.5 amp	1.0 amp	1.7 amp.
VISUAL REFLECTOMETER (2M7)	PWR (2S3)	100%			
	VSWR	1.1			
EXCITER					
Meter (2M101)	Selector Switch (2S101)				
	V101 & V102 I_k	3 (right)			
	V105 I_c	2-3 (left)			
	V106 I_c	2-3 (left)			
	V107 I_c	3-5 (left)			
	V107 I_k	4-5 (left)			
	AFC	0-1 (left or right)			
	V122 I_c	1-2 (left)			

TABLE 19. TYPICAL METER PANEL INDICATIONS (CONTINUED)

Meter Nomenclature	Switch and Position	Meter Indications			
		No Variation With Modulation	White Picture (25% Sync)	Mid-Characteristic (No Modulation)	Black Picture (25% Sync)
METER (2M101) (Continued)	V123 I_c	2-3 (left)			
	V124 I_c	2-3 (left)			
	V125 I_c	3-5 (left)			
	V125 I_k	4-5 (right)			
MODULATOR					
TOTAL MOD. CURRENT (2M302)	--		115 mA	150 mA	180 mA
DC METER (2M301)	DC METER (2S301)				
	1ST VIDEO I_p 0-100 MA	20 mA			
	INVERTER I_p 0-100 MA	10 mA			
	LIN. CORR I_p 0-100 MA	7 mA			
	2ND VIDEO I_p 0-100 MA	35 mA			
	3RD VIDEO L I_k 0-300 MA		95 mA	70 mA	45 mA
	3RD VIDEO R I_k 0-300 MA		95 mA	70 mA	45 mA
	MOD. NO. 1 IK 0-300 MA		55 mA	60 mA	65 mA

TABLE 19. TYPICAL METER PANEL INDICATIONS (CONTINUED)

Meter Nomenclature	Switch and Position	Meter Indications			
		No Variation With Modulation	White Picture (25% Sync)	Mid-Characteristic (No Modulation)	Black Picture (25% Sync)
DC METER (2M301)	MOD. NO. 2 IK 0-300 MA		55 mA	60 mA	65 mA
	MOD. NO. 3 IK 0-300 MA		55 mA	60 mA	65 mA
	MOD. NO. 4 IK 0-300		55 mA	60 mA	65 mA
	REGULATOR METERING (2S302)				
	NOTE: DC METER selector switch (2S301) must be set REGULATORS position for following indications)				
	OFF				
	HI. VOLT 0-100 V	575 V			
	LO. VOLT 0-300 V	250 V			
	V338A I_p 0-1 AMP		135 mA	118 mA	125 mA
	V338B I_p 0-1 AMP		135 mA	118 mA	125 mA

TABLE 19. TYPICAL METER PANEL INDICATIONS (CONTINUED)

Meter Nomenclature	Switch and Position	Meter Indications			
		No Variation With Modulation	White Picture (25% Sync)	Mid-Characteristic (No Modulation)	Black Picture (25% Sync)
DC METER (2M301) (Continued)	V339A I_p 0-1 AMP		135 mA	118 mA	125 mA
	V339B I_p 0-1 AMP		135 mA	118 mA	125 mA
	V333A I_p 0-300 MA	60 mA			
	V333B I_p 0-300 MA	60 mA			
	V334A I_p 0-300 MA	60 mA			
	V334B I_p 0-300 MA	60 mA			

b. Remove resistor 1R2 (visual modulated-amplifier screen voltage).

c. Remove resistor 12R3 (2nd visual amplifier plate voltage).

d. Remove resistor 1R4 and adjacent metallic rod (2nd visual amplifier screen voltage).

e. Remove resistor 1R9 (1st visual amplifier screen voltage).

f. Remove resistor 12R5 and 12R6 (2nd aural amplifier plate voltage).

g. Remove resistor 1R6 and adjacent metallic tubing (2nd aural amplifier screen voltage).

2. Connect primaries of 10T1 and 12T1 according to Table 7.

FIRST AURAL AMPLIFIER

1. Set transmitting equipment controls to following positions:

Control	Position
AC MAIN LINE circuit breaker (11S1)	ON
AUXILIARY circuit breaker (11S2)	ON
Safety Switch (11S3)	Closed
CONTROL circuit breaker (1S1)	ON
FILAMENT switch (1S2)	ON
EXCITER switch (1S4)	ON
TRANSMITTER ON/AIR ON pushbutton switch (1S13)	Press (On)
PLATE ON pushbutton switch (1S16)	Press (On)
LOW VOLTAGE switch (1S3)	ON

2. Rotate MULTIMETER selector switch (2S2) to position 1 (1ST AUR AMPL GRID CURRENT) and adjust 1ST AURAL AMPL INPUT TUNING (2C612) and INPUT LOADING (2C611) controls for a maximum indication on MULTIMETER (2M4).

3. Adjust 1ST AURAL AMPL PLATE TUNING control (2L605) for a minimum indication (approximately 100 mA) on MULTIMETER (2M4). Rotate MULTIMETER selector switch (2S2) to position 5 (2ND AUR AMPL GRID CURRENT) and observe an approximate 20 to 30 mA indication on MULTIMETER (2M4).

SECOND AURAL AMPLIFIER NEUTRALIZATION

1. Connect an 80 watt, 51.5 ohm R-F Load and Wattmeter (refer to Table 6) to output of 2nd aural amplifier (2V602). Set meter on the 20 watt scale and the aural tuning controls to positions specified in Table 20.

2. Adjust 2ND AURAL AMPL PLATE TUNING control (2L601) and 2ND AURAL AMPL OUTPUT TUNING control (2C626) for a maximum indication on R-F Load and Wattmeter.

TABLE 20. AURAL SECTION, APPROXIMATE DIAL SETTINGS

Control	Symbol	Channel
1ST AURAL AMPL PLATE TUNING	2L605	NOTE: Information not available. Use existing dial settings on unit.
2ND AURAL AMPL PLATE TUNING	2L610	
2ND AURAL AMPL OUTPUT TUNING	2C626	

3. Observe wattmeter indication, and then press the PLATE OFF (1S17) and TRANSMITTER OFF (1S14) pushbutton switches; TRANSMITTER OFF (1I4) and PLATE OFF (1I6) indicator lamps light.

4. Enter enclosure and open door to second aural amplifier compartment. Discharge any static charge that may have built up on plate and screen of 2V602 using the grounding stick. Remove clear plastic access plate and move four sliding contacts of 2L607, located in four slots in screen contact ring, a small amount all in the same direction. Replace access plate using only four screws; close R-F compartment and door. Apply power to transmitter and observe indication on wattmeter. If power has increased, remove power and move contacts in opposite direction; if power has decreased, continue moving contacts in same direction. When feedthrough power indication on the wattmeter approaches one watt, move only one or two contacts instead of all four. Continue above procedure until a minimum wattmeter indication is obtained, which should be nearly zero. Replace all screws in access plate.

5. Press PLATE OFF pushbutton switch (1S16) and set AC MAIN LINE circuit breaker (11S1) to the OFF position.

6. Disconnect 80 watt, 51.5 ohm R-F Load and Wattmeter from output of the 2nd aural amplifier (2V602) and connect to output of visual modulated amplifier. Connect R-F Load and Wattmeter MI-27396 to output of 2nd aural amplifier.

SECOND AURAL AMPLIFIER TUNING

1. Reinstall resistors 12R5, 12R6, 1R6, and metallic tubing adjacent to 1R6 to apply plate and screen voltages to second aural amplifier.

> NOTE: The metallic tubing and resistor 1R6 should be installed so that one end of excitation potentiometer 1R5 is grounded through the tubing. This condition exists when the metallic tubing is toward the rear of the transmitter with respect to resistor 1R6.

2. Set AC MAIN LINE circuit breaker (11S1) to ON. Press AURAL EXCITATION switch 2S4 toward DECREASE until wiper arm on 1R5 reaches the grounded end of the potentiometer. Check R-F load to ensure proper operation.

3. Press PLATE ON pushbutton switch (1S16). Recheck tuning controls adjusted during neutralization to ensure that they are still adjusted for maximum power output. Increase

screen voltage by pressing AURAL EXCITATION switch(2S4)toward INCREASE until power output reaches approximately 1 KW. Rotate MULTIMETER selector switch(2S2)to position 6 (2ND AUR AMPL SCREEN CURRENT) and observe MULTIMETER(2M4)for a loading indication. As loading is increased screen current will decrease. Keep screen current below 50 mA while tuning. Adjust 2ND AURAL AMPL OUTPUT TUNING control in small increments and then readjust the 2ND AURAL AMPL PLATE TUNING control for a dip in plate current as observed on 2ND AURAL PLATE meter(2M2). Loading will require readjustment when output power level is changed. Adjust the excitation and tuning controls for the desired power output at the efficiency indicated in Figure 8.

AURAL REFLECTOMETER CALIBRATION

> NOTE: If the aural power is 3 kW or higher, the MI-19087-A Monitoring Unit should be used and these instructions ignored.

1. With the aural transmitter operating at licensed power output, rotate the aural REFLECTOMETER (left side) with a tuning crank to the INCIDENT position and set PWR/VSWR/VSWR CAL selector switch(2S1)to PWR position.

2. Adjust the power calibrate potentiometer(2R601)for a reading of 100% on AURAL REFLECTOMETER meter(2M1). If a 100% reading cannot be attained, it will probably be necessary to adjust 6L1 on the reflectometer head for a maximum reading. Since it is necessary to enter the near enclosure to adjust the core of 6L1, it should be done by a trial and error method.

AURAL VSWR MEASUREMENT

Set 2S1 to VSWR position and adjust VSWR calibrate potentiometer(2R28)(small knob in the center of PWR/VSWR/VSWR/CAL selector switch) for a reading of 100% on 2M1. Then rotate the reflectometer head to REFLECTED position and read the VSWR directly on the bottom scale of 2M1.

> NOTE: The VSWR CAL position of 2S1 is used only when the MI-19087-A Monitoring Unit is used.

AURAL MONITORING UNIT CALIBRATION (See Figure 33.)

1. Remove the type 2D21 tube, V51, from aural monitoring unit MI-19087-A and rotate both reflectometer heads to the INCIDENT position.

2. Operate PWR/VSWR/VSWR CAL Selector switch (2S1) to the VSWR position and adjust VSWR Calibrate potentiometer (2R28) to a position where AURAL REFLECTOMETER meter 2M1 reads on scale. Adjust the core of L2 on the VSWR reflectometer head for maximum indication on 2M2. Adjust VSWR Calibrate potentiometer (2R28) for a reading of 100% on 2M1.

3. Operate PWR/VSWR/VSWR CAL selector switch(2S1)to the VSWR CAL position. Adjust the core of L1 on the PWR reflectometer head for maximum indication on meter 2M2.

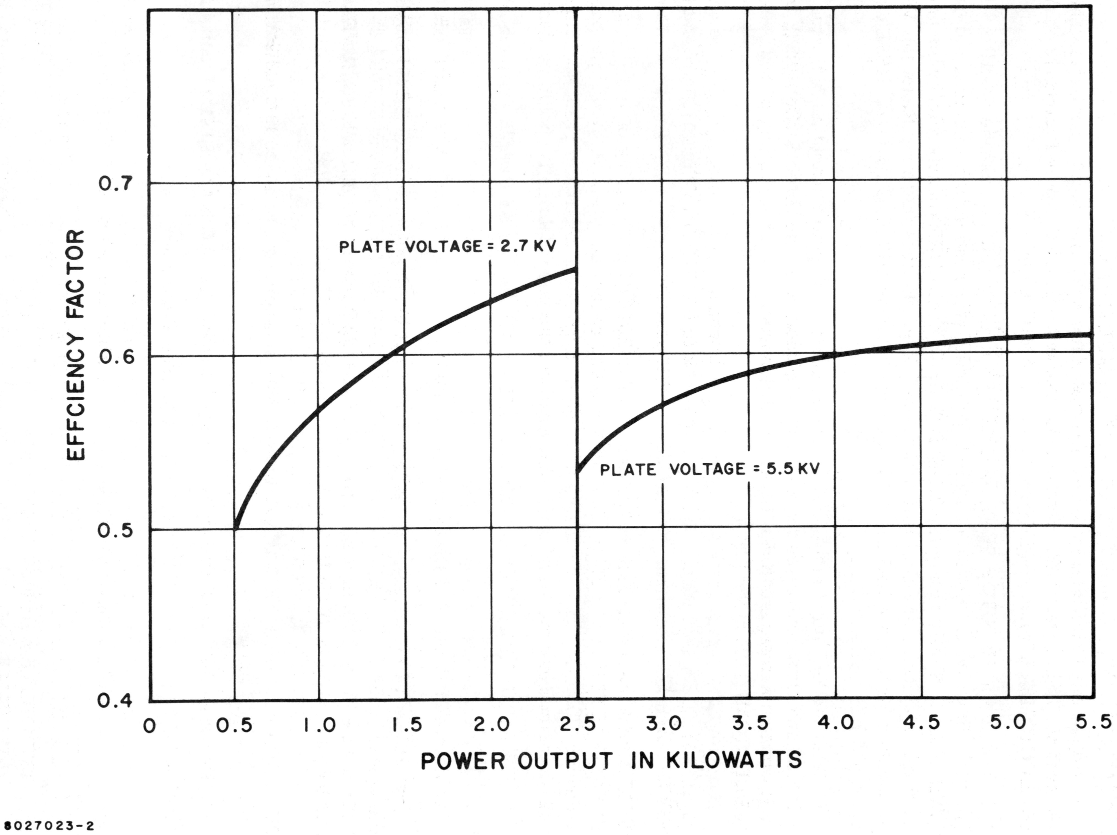


Figure 8—Aural Power Curve - Efficiency Factor vs Power Output

Adjust the BALANCE control (R51) for a reading of 25% on meter 2M1. Rotate the VSWR reflectometer head to the REFLECTED position.

4. Adjust the VSWR calibrate potentiometer for a reading of 100% on meter 2M2. Set switch 2S1 to the VSWR position and read the output line VSWR directly on AURAL REFLECTOMETER meter (2M1).

5. Rotate the MONITOR SENS control (R59) to the extreme clockwise position. Install the type 2D21 tube, V51. Rotate the VSWR reflectometer head until meter 2M1 indicates a VSWR of 1.7. Slowly rotate the MONITOR SENS control (R59) counterclockwise until the overload relay trips and removes plate power from the transmitter. Reset the VSWR reflectometer head to the REFLECTED position. Press OVERLOAD/O. L. RESET pushbutton switch.

6. With the 2nd aural amplifier operating at licensed power output as indicated by the R-F load and wattmeter, set the PWR/VSWR/VSWR CAL selector switch (2S1) to the PWR position and adjust POWER CAL potentiometer R56 for a reading of 100% on AURAL REFLECTOMETER meter (2M1).

7. Press PLATE OFF pushbutton switch (1S17) and set AC MAIN LINE circuit breaker (11S1) to OFF positions.

FIRST VISUAL AMPLIFIER TUNING

1. Set visual tuning controls to positions specified in Table 21.

2. Replace resistor 1R9 (1st Visual Amplitude Screen Voltage).

3. Set AC MAIN LINE circuit breaker (11S1) to ON and press PLATE ON pushbutton switch (1S16).

4. Rotate MULTIMETER selector switch (2S2) to position 9 (1ST VIS AMPL GRID CURRENT) and adjust 1ST VISUAL AMPL INPUT TUNING (2C667) and INPUT LOADING (2C666) controls until MULTIMETER 2M4 indicates approximately 10-15 mA.

5. Rotate MULTIMETER selector switch 2S2 to position 10 (1ST VIS AMPL CATHODE CURRENT). Adjust 1ST VISUAL AMPL PLATE TUNING control (2L653) for a minimum indication on MULTIMETER (2M4). Rotate MULTIMETER selector switch to position 11 (2ND VIS AMPL GRID CURRENT) and observe an approximate 10-15 mA indication on MULTIMETER (2M4).

6. Press PLATE OFF pushbutton switch (1S17) and set AC MAIN LINE circuit breaker (11S1) to OFF.

TABLE 21. VISUAL SECTION, APPROXIMATE DIAL SETTINGS

Control	Symbol	Channel
1ST VISUAL AMPL PLATE TUNING	2L653	NOTE: Information not available. Use existing dial settings on unit.
2ND VISUAL AMPL PLATE TUNING	2L658	
MOD AMPL PLATE TUNING	2L663	
MOD AMPL OUTPUT TUNING	2C690	
MOD AMPL BANDWIDTH	2C691	

NOTE: The dial settings of the visual modulated amplifier controls are for broadband tuning. When tuning for maximum feedthrough power during neutralization procedure, some of the dial settings will change considerably. Return to the dial settings shown in this table before broadbanding the stage.

SECOND VISUAL AMPLIFIER TUNING

1. Adjust swamping capacitor (2C684) until plates are about half meshed.

2. Replace resistors 12R3 and 1R4 and the metallic rod adjacent to 1R4 in such a manner that one terminal of the excitation potentiometer 1R3 is grounded through the tubing.

   NOTE: The metallic rod should be to the rear of the transmitter with respect to 1R4.

3. Set AC MAIN LINE circuit breaker (11S1) to ON and press VISUAL EXCITATION switch 2S6 to DECREASE position until the sliding contact of 1R3 reaches grounded end. Rotate MULTIMETER selector switch (2S2) to position 12 (2ND VIS AMPL CATHODE CURRENT).

4. Press PLATE ON pushbutton switch (1S16) and press VISUAL EXCITATION switch 2S7 to INCREASE until MULTIMETER (2M4) indicates approximately 0.2 ampere.

5. Rotate MULTIMETER selector switch (2S2) to position 18 (SWAMPING). Adjust 2ND VISUAL AMPL PLATE TUNING control (2L658) and swamping capacitor (2C684) for a maximum indication on MULTIMETER (2M4).

6. Rotate MULTIMETER selector switch (2S2) to position 19 (GRID TRAP TUNING INDICATOR). Adjust 2C680 for a minimum indication on MULTIMETER (2M4).

VISUAL MODULATED AMPLIFIER NEUTRALIZATION

1. Adjust PEDESTAL LEVEL control until MOD AMPL BIAS meter (2M5) indicates 200 volts. Set MULTIMETER selector switch (2S2) to position 12 (2ND VIS AMPL CATHODE CURRENT). Press VISUAL EXCITATION switch (2S7) toward INCREASE until MULTIMETER (2M4) indicates 0.25 amperes. Set MULTIMETER selector switch (2S2) to position 18 (SWAMPING) and observe that MULTIMETER (2M4) indicates between 50 and 70.

   NOTE: Throughout the remainder of this procedure, maintain a constant swamping indication of between 50 to 70 (MULTIMETER selector switch set to position 18) by adjusting VISUAL EXCITATION switch.

2. Connect 80 watt, 51.5 ohm R-F Load and Wattmeter to output of visual modulated amplifier.

3. Adjust MOD AMPL PLATE TUNING control (2L663), mod ampl output cooling loop (2L664), MOD AMPL OUTPUT TUNING control (2C690), and MOD AMPL BANDWIDTH control (2C691) for maximum feedthrough power. Note the wattmeter indication.

4. Remove power and adjust contacts (2L660) in the four slots of the visual modulated-amplifier screen contact ring, as performed in the aural neutralizing procedure.

5. Repeat above procedure until feedthrough power reaches a minimum, then press PLATE OFF pushbutton switch (1S17) and set AC MAIN LINE circuit breaker 11S1 to OFF.

VISUAL MODULATED AMPLIFIER TUNING

1. Replace small R-F load at output of visual modulated amplifier with R-F Load and Wattmeter MI-27396.

2. Replace resistors 12R1, 12R2, and 1R2 to restore plate and screen grid voltages to the visual modulated amplifier.

3. Connect the video sweep output of Sideband Response Analyzer BW-5B to modulator input jack, 2J303, using 75 ohm coaxial cable. Connect a length of 50 ohm coaxial cable between R-F jack, 7J51, on visual output line and R-F input jack on analyzer. Insert 6-dB attenuator, supplied with analyzer, in series with this cable at analyzer input jack. Connect analyzer oscilloscope output cables to corresponding horizontal and vertical inputs of an oscilloscope.

4. Adjust analyzer sweep output to provide approximately 0.5 volt peak-to-peak. Set VIDEO GAIN control on the modulator chassis to position 2. Set COUPLING switch (2S303) to the AC position.

Set AC MAIN LINE circuit breaker (11S1) to ON and press TRANSMITTER ON/AIR ON pushbutton switch (1S13). After PLATE READY Indicator lamp (1I3) has lighted, press PLATE ON pushbutton switch (1S18). Adjust PEDESTAL LEVEL control for a reading of 250 volts on MOD AMPL BIAS meter (2M5).

6. Press VISUAL EXCITATION control toward INCREASE until a power output of about 1.5 kW is obtained. If necessary, tune analyzer according to its instruction book. Adjust visual modulated amplifier controls to obtain a frequency response which approximates ideal response shown in Figure 9. Increase excitation to obtain an output of 1.5 kW as response approaches ideal. Modulation should be adjusted for 20% of peak carrier.

7. Adjust PEDESTAL LEVEL control for a reading of 200 volts on MOD AMPL BIAS meter (2M5). Press VISUAL EXCITATION control toward INCREASE until a power output of 3.6 kW is obtained on the wattmeter. Observe that the amplifier plate current does not exceed 1.7 amperes. If plate current does exceed 1.7 amperes, reduce bandwidth and retune for flat response.

8. Set MULTIMETER selector switch to position 19 and adjust the grid trap for a minimum indication on MULTIMETER (2M4). It may be necessary to readjust 2nd visual amplifier tuning and swamping controls.

VISUAL REFLECTOMETER CALIBRATION

1. Apply a black-picture signal input to modulator video input jack (2J303). Set the VIDEO GAIN control to ZERO and turn the transmitter on.

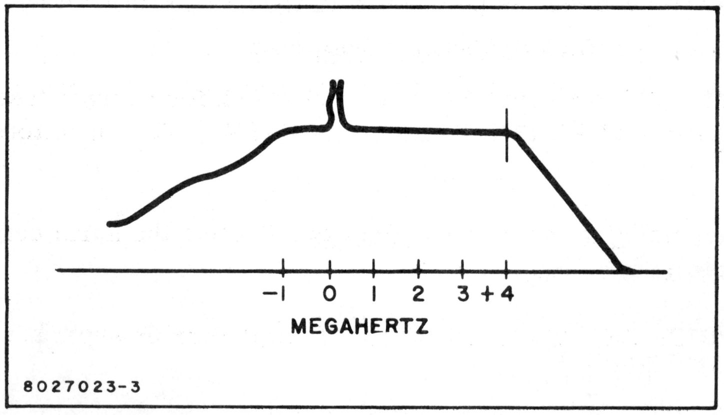


Figure 9. Ideal Response of Visual Modulated Amplifier

2. Adjust the PEDESTAL LEVEL control for 220 volt reading on the VISUAL MOD AMPL BIAS meter and then adjust the VISUAL EXCITATION control for a wattmeter reading of 56 percent of the station's licensed power. At this point the output of the monitoring diode in the visual output line should be approximately 0.5 volt dc across the 75-ohm termination. If necessary, adjust the coupling probe on the monitoring diode.

3. Observe the output of the monitoring diode on an oscilloscope, preferably using the monitoring equipment which will normally be used for program monitoring at the transmitter. Use a chopper to establish zero reference. Adjust the VIDEO GAIN and VISUAL EXCITATION controls to obtain the desired peak power output, while maintaining 25 percent sync. To calculate the peak power when 25 percent sync is used, multiply the average power by 1.68. For example, 3.57 kW average multiplied by 1.68 gives 6 kW peak power.

Set PWR/VSWR selector switch (2S3) to PWR position and rotate the visual reflectometer head to the INCIDENT position. Adjust the core in coil (7L1) for maximum reading on visual reflectometer (2M7). Adjust POWER CALIBRATE control (2R651) for a reading, of 100% on 2M7. Lock 2R651 by turning locking nut clockwise.

VISUAL VSWR MEASUREMENT

Set 2S3 to VSWR position with the reflectometer head in the INCIDENT position and adjust the VSWR calibrate potentiometer (2R1) for a reading of 100% on 2M7. Rotate the head to REFLECTED and read the VSWR directly on the bottom scale of 2M7.

TRANSMITTER FINAL ADJUSTMENTS

Aural Carrier Frequency Zero Deviation Adjustment

1. Check visual oscillator crystals 2Y101 and 2Y102 for correct frequency. If frequency is not correct, adjust VISUAL FREQUENCY ADJUSTMENTS (capacitors 2C216 and 2C217) as necessary.

> NOTE: Performing step 2 is equivalent to adjusting the aural carrier frequency deviation to zero.

2. Adjust CARRIER SEP ADJ control (2C272) until carrier separation is 4.5 MHz.

Off Frequency Interlock Circuit Adjustment

1. Adjust OFF-FREQ INTERLOCK SENSITIVITY control 2R121 to extreme counterclockwise position. Set AFC/MANUAL toggle switch (2S102) to AFC. Modulate aural transmitter 133% with a 50 hertz tone

2. Slowly adjust OFF-FREQ INTERLOCK SENSITIVITY control (2R121) in a clockwise direction until relay 2K102 operates. Turn 2R121 counterclockwise slowly until 2K102 de-energizes, then increase modulation until 2K102 operates. Tighten locking nut on 2R121 in this position.

3. Operate transmitter with rated peak-power output modulated with a picture signal containing reference white. Then adjust the monitoring diode pick-up probe to obtain approximately 0.75-volt peak-to-peak output when transmitter is modulated to 12.5 percent and diode is properly terminated with 75 ohms. The monitoring diode will give an output which can be used for measurement of waveform, modulation depth, linearity, and for comparative checks on picture quality. However, a diode cannot give a correct picture indication as it should appear through a receiver or a vestigial sideband demodulator. Evaluation of overall transmitted picture information requires a vestigial sideband demodulator connected after the vestigial sideband filter.

4. Check overall variations in output over one field. The variations should be less than 5 percent to meet FCC requirements.

5. Measure line voltage with the complete transmitter operating at rated power. If the voltage has dropped because of line regulation, change connections on transformer taps, as listed in Table 7.

COLOR SIGNAL ADJUSTMENTS

GENERAL

The color signal adjustments should be performed only after all of the preceding adjustment and tuning procedures have been accomplished. Units in the Input and Monitoring Equipment Racks are provided specifically for adjusting the color signal and to meet specifications with respect to amplitude vs frequency response and delay distortion (envelope delay vs frequency).

The interconnection of the various units (see Figure 10) for color signal adjustment should be carefully observed. The TA-9 color stabilizing amplifier is not required for correction of transmitter linearity error, as the modulator includes the necessary linearity correction circuits. However, a TA-9 stabilizing amplifier may be required to correct deficiencies in input signal to the transmitter, such as hum, noise, sync compression, switching transients, and poor low-frequency response.

The transmitter visual modulator contains two clamp circuits which can correct for some input signal errors, such as hum, low-frequency noise, and tilt caused by poor low-frequency response. The modulator also has some reserve sync-stretching ability which can be utilized to compensate for deficient sync amplitude in the input signal.

The 4.75 MHz Low Pass Filter and Equalizers are passive networks requiring accurate source impedances and load terminations. Each termination will reflect at least a small portion of the signal, making it necessary to utilize distribution amplifiers to isolate reflections and to prevent network interaction. In addition the distribution amplifiers compensate for approximately 5.5 dB insertion loss through the 4.75 MHz Low Pass Filters and Phase Equalizers.

SYSTEM ADJUSTMENTS

1. Additional notes on settings and adjustments for color systems are given in the discussion on color operation in the OPERATION section of this book.

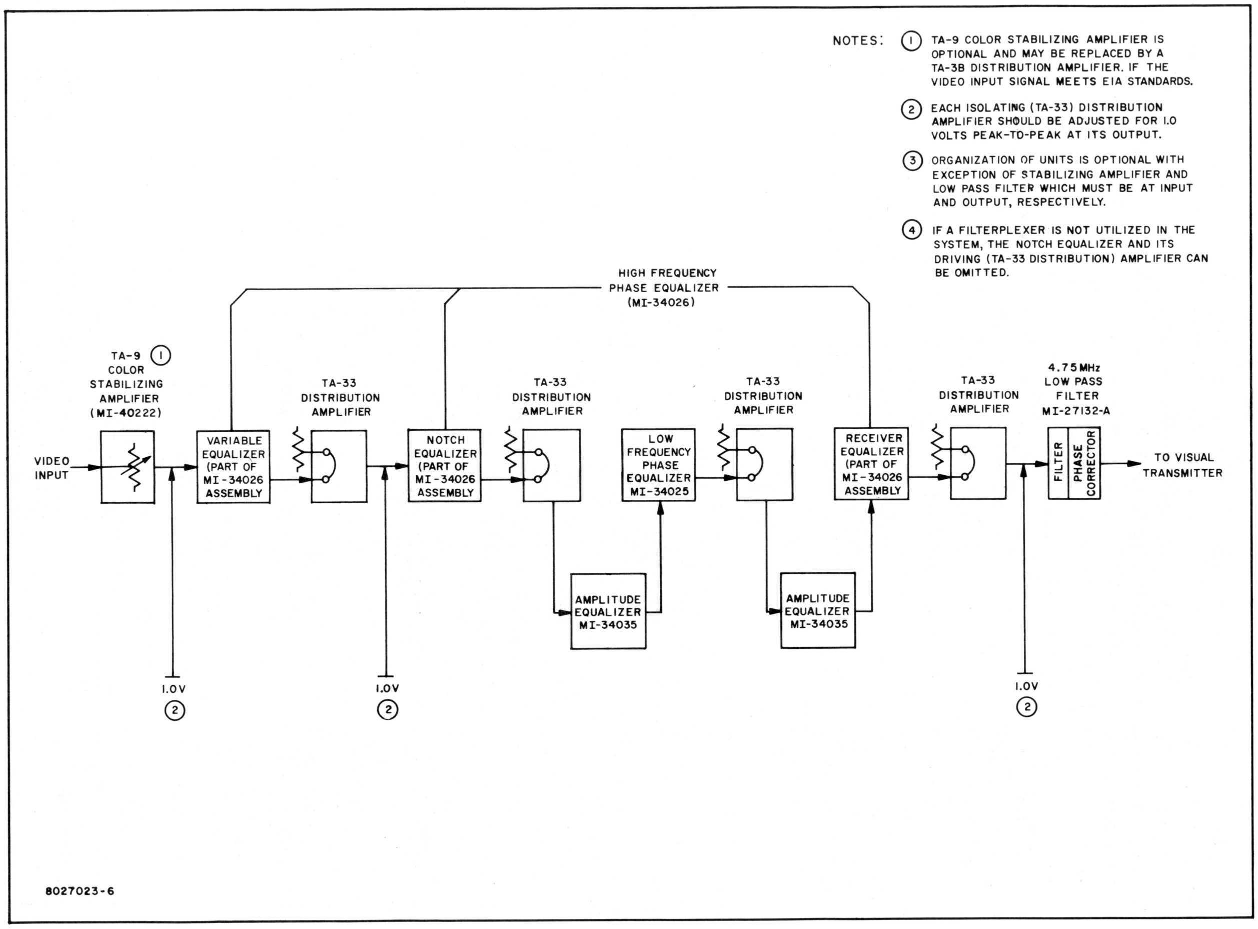
2. The 4.75 MHz Low Pass Filter and Phase Equalizers have been properly aligned at the factory and all adjusting screws have been sealed to prevent accidental changes of adjustments, consequently no adjustments are required. The phase equalizers must be set for phase compensation in according to step 3. It is assumed that the stabilizing amplifier, if used, and the distribution amplifiers have been checked for correct performance as detailed in their respective instruction books.

3. Phase Equalizers

Set the controls on the MI-34025 and MI-34026 phase equalizers to the following positions:

Equipment	Control	Position
Low-Frequency Phase Equalizer MI-34025	VARIABLE EQUALIZER	IN
	S1 DELAY S2	1
High-Frequency Equalizer MI-34026		
Receiver Equalizer	RECEIVER EQUALIZER S1	IN
	*NOTCH EQUALIZER S2	IN
	*NOTCH EQUALIZER CURVE S3	A
Variable Equalizer	VARIABLE EQUALIZER S4	IN
	DELAY S5	3
	VARIABLE EQUALIZER FIXED DELAY S6	OUT

*Notch Equalizer required only if notch diplexer or filterplexer is used.


TA-9 ①
COLOR
STABILIZING
AMPLIFIER
(MI-40222)
VIDEO
INPUT
VARIABLE
EQUALIZER
(PART OF
MI-34026
ASSEMBLY
TA-33
DISTRIBUTION
AMPLIFIER
NOTCH
EQUALIZER
(PART OF
MI-34026
ASSEMBLY
TA-33
DISTRIBUTION
AMPLIFIER
HIGH FREQUENCY
PHASE EQUALIZER
(MI-34026)
LOW
FREQUENCY
PHASE
EQUALIZER
MI-34025
TA-33
DISTRIBUTION
AMPLIFIER
RECEIVER
EQUALIZER
(PART OF
MI-34026
ASSEMBLY
TA-33
DISTRIBUTION
AMPLIFIER
4.75MHz
LOW PASS
FILTER
MI-27132-A
FILTER
PHASE
CORRECTOR
TO VISUAL
TRANSMITTER
AMPLITUDE
EQUALIZER
MI-34035
AMPLITUDE
EQUALIZER
MI-34035
1.0V
②
1.0V
②
1.0V
②
8027023-6

NOTES:

① TA-9 COLOR STABILIZING AMPLIFIER IS OPTIONAL AND MAY BE REPLACED BY A TA-3B DISTRIBUTION AMPLIFIER. IF THE VIDEO INPUT SIGNAL MEETS EIA STANDARDS.

② EACH ISOLATING (TA-33) DISTRIBUTION AMPLIFIER SHOULD BE ADJUSTED FOR 1.0 VOLTS PEAK-TO-PEAK AT ITS OUTPUT.

③ ORGANIZATION OF UNITS IS OPTIONAL WITH EXCEPTION OF STABILIZING AMPLIFIER AND LOW PASS FILTER WHICH MUST BE AT INPUT AND OUTPUT, RESPECTIVELY.

④ IF A FILTERPLEXER IS NOT UTILIZED IN THE SYSTEM, THE NOTCH EQUALIZER AND ITS DRIVING (TA-33 DISTRIBUTION) AMPLIFIER CAN BE OMITTED.

Figure 10. Color Signal Adjustment Unit Interconnection Diagram

4. Video Terminations

Check video terminations as shown on the signal circuit diagram (see figure 35). It is important that 1 percent terminations be used on the passive networks, otherwise phase and amplitude characteristics may be altered. The transmitter video input termination should also be set for 1% accuracy.

5. Amplitude vs Frequency Response

a. The frequency response of the entire system must be maintained as flat as possible over the entire video transmission band. Poor frequency response may cause degraded transient response in the picture and errors in color saturation. Thus, if the response at the color-subcarrier region is low, the colors will be "washed-out" or pastel.

b. Measurement of frequency response is complicated because of the number of cascaded individual items. If each item is adjusted separately for correct response, any fixed error in measurement will be cumulative in the overall result, but this difficulty may be obviated by calibrating the measuring circuit. If the video sweep oscillator generates appreciable harmonic output, there will be further error.

c. In the measurement of a low pass filter, the harmonics will not appear in the output if they fall beyond the cutoff frequency of the filter. This may result in steps in the frequency response at submultiples of the cutoff frequency. The magnitude of such steps may be taken as an indication of harmonic content in the sweep oscillator output.

d. If the sweep oscillator has excessive harmonic output, the oscillator must be checked for defective tubes and/or incorrect adjustment. The necessary corrective action must be taken before making final measurements of transmitter and auxiliary equipment.

e. If the system response is not uniform at all points, a small correction may have to be made at some point in the system. Any such correction may be affected in peaking circuits of distribution amplifiers. In the transmitter modulator, the HI PEAKER FREQ and HI PEAKER AMP controls may be used for minor compensating adjustments.

f. If the frequency response at the transmitter input is not correct, individual components must be checked to determine the fault and corrective action taken.

g. Energize transmitter and set modulator COUPLING switch to AC. Adjust PEDESTAL LEVEL control for mid-characteristic operation. Using the Sideband Response Analyzer BW-5B, observe the frequency response from the system input to the antenna transmission line and check for compliance with the specifications.

VISUAL MODULATOR—FINAL ADJUSTMENTS

Final adjustments on the visual modulator are primarily for linearity correction. The linearity and phase correction circuits should first be checked for proper operation; details are supplied in the MAINTENANCE section under Modulator Servicing. For overall linearity and phase correction of the transmitter proceed as follows:

1. Connect linearity checker to supply a signal input to the transmitter through the low-pass filter and the color equalizers. Adjust linearity checker for 40 units of sync, 100 units of luminance, and 3.58 MHz color subcarrier component with an amplitude of 14 units peak-to-peak. The total signal amplitude should be approximately 1 volt. (See Figure 11).

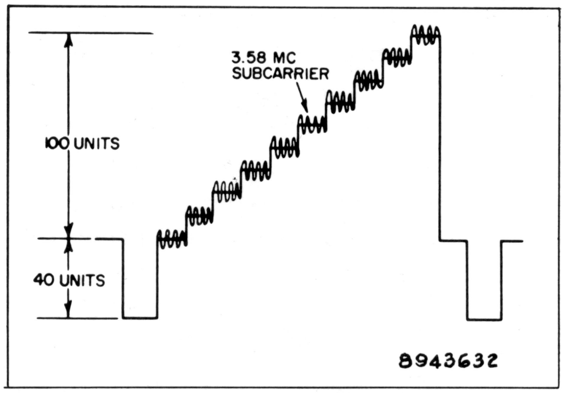


Figure 11. Waveform Produced By Linearity Checker

2. It is advisable to operate color terminal equipment in the video input circuits (see Figure 10) below specified maximum peak to peak amplitudes. The overall gain of the modulator is such that 0.7 volt peak-to-peak (including sync) will develop full output.

3. Measure the linearity and differential phase of the units between the linearity checker and the transmitter input at 10-, 50-, and 90-percent average picture level. If the linearity error is more than 5 percent or if the differential phase is over 2 degrees, the distribution amplifiers should be corrected or the levels should be reduced to obtain satisfactory performance. The equalizers do not affect the differential phase or linearity, but they are included in the adjustment arrangement because they are normally part of the color system equipment that furnishes an input to the transmitter. If desired, the linearity of the transmitter may be adjusted without the line equalizers and amplifiers. This will be necessary if the transmitter system does not include the equalizers which are required for color.

4. Connect the transmitter and the test equipment as shown in Figure 12.

5. On the visual modulator, set LINEARITY CORRECTOR switch(2S304)to ON. Adjust LINEARITY controls A, B, C, and D to maximum counterclockwise position. Set COUPLING switch (2S303) to DC.

6. Adjust transmitter for licensed peak power output using PEDESTAL LEVEL, VIDEO GAIN, and VISUAL EXCITATION controls. Observe monitoring diode output while adjusting video input signal level for correct modulation at required power output. Note that the last step in the waveform as observed on the oscilloscope (without the 3.58 MHz signal) should correspond to the 15-percent level for full modulation. (See Figure 13).

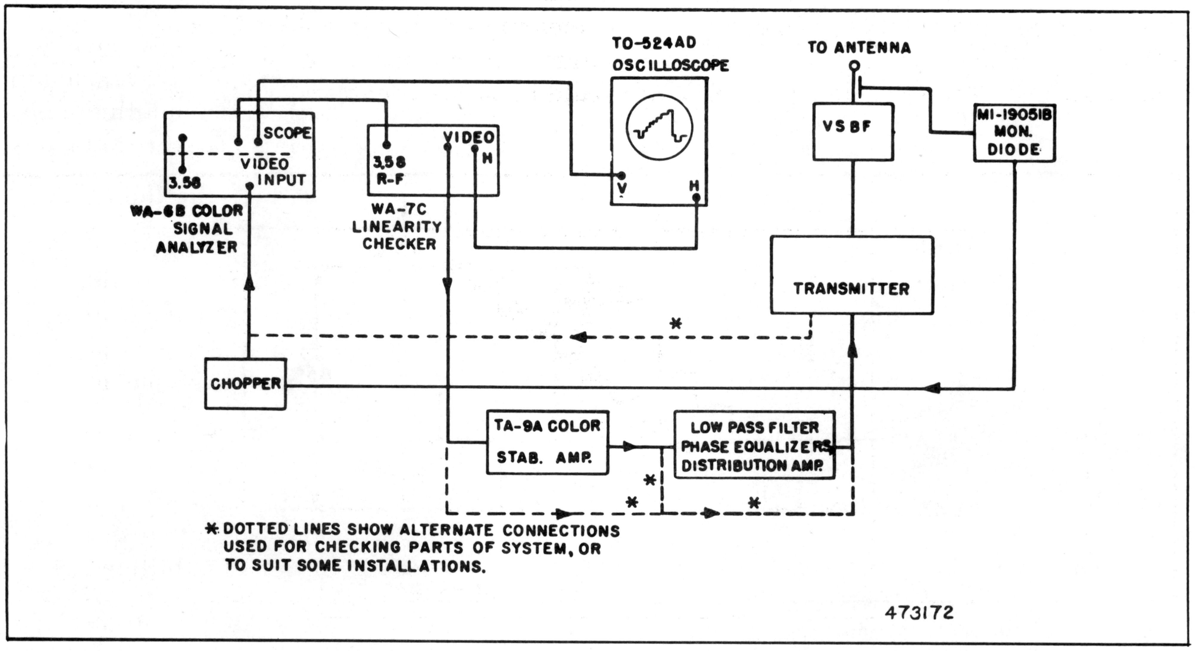

TO-524AD
OSCILLOSCOPE
TO ANTENNA
SCOPE
VIDEO
INPUT
3.58
WA-6B COLOR
SIGNAL
ANALYZER
VIDEO
H
3.58
R-F
WA-7C
LINEARITY
CHECKER
V
H
VSBF
MI-19051B
MON.
DIODE
TRANSMITTER
*
CHOPPER
TA-9A COLOR
STAB. AMP.
LOW PASS FILTER
PHASE EQUALIZERS
DISTRIBUTION AMP.
*
*
*
* DOTTED LINES SHOW ALTERNATE CONNECTIONS
USED FOR CHECKING PARTS OF SYSTEM, OR
TO SUIT SOME INSTALLATIONS.
473172

Figure 12. Block Diagram of Test Setup for Linearity Adjustments and Differential Phase Measurements

7. It may be necessary to adjust LINEARITY D control clockwise to stretch the sync, but DO NOT turn the control far enough to stretch any step components.

8. When using the diode in this manner (connected after the vestigial filter), the effective output at the subcarrier frequency is 50-percent of its true value when referred to the luminance components. Thus, 10-percent subcarrier modulation is indicated when the subcarrier modulation in the diode output is 5 percent of the zero to peak of sync amplitude.

9. With the cross-over filter set to the high-pass position, advance LINEARITY A control clockwise, progressively stretching the steps beginning at the white end and going toward black. Since this results in an increase of total modulation, the setting of STEP AMPLITUDE control on the linearity checker must be reduced to maintain the luminance component of the most white step at a level of 15 percent. Control "A" should be turned clockwise to obtain the best linearity; if it is turned too far the steps near the midcharacteristic will be greater than the others, resulting in poor linearity.

10. Adjust DIFFERENTIAL PHASE control A to obtain minimum differential phase. The differential phase controls are operative only for signal amplitudes that cause conduction in the associated diode.

11. Repeat adjustments in steps 9 and 10, but substitute LINEARITY and DIFFERENTIAL PHASE controls B for A controls of like nomenclature.

12. Repeat steps 9 and 10, substituting controls C for A.

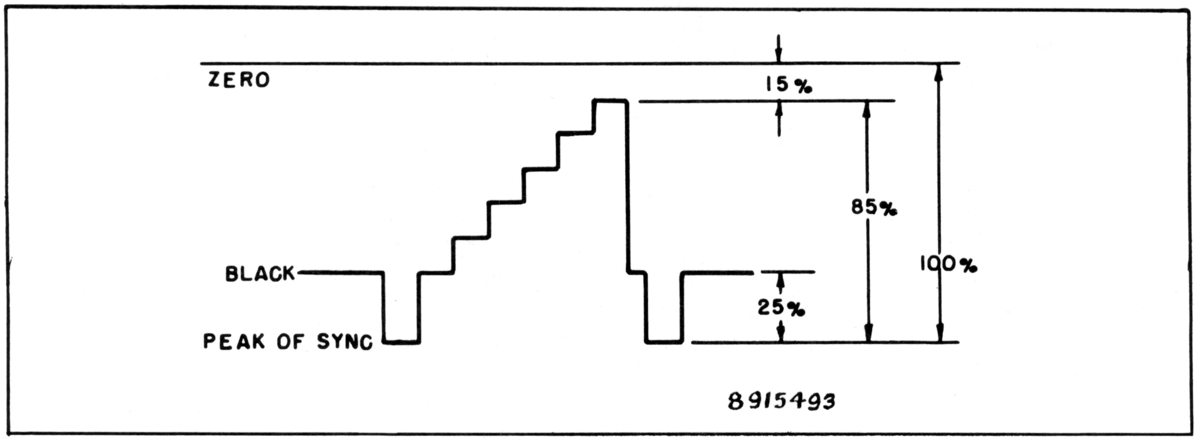


Figure 13. Reference Waveforms for Modulation Depth

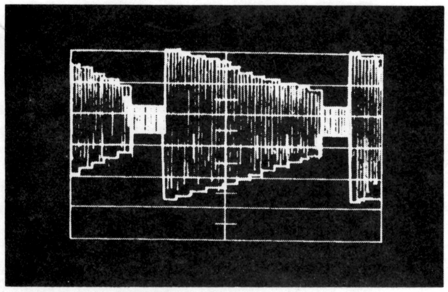
NOTE: Do not OVERCORRECT linearity. The amplitude of any corrected steps (3.58 MHz component) should not exceed the amplitude of the largest uncorrected step. Linearity overcorrection may result in increased differential phase error and difficulty in maintaining correct modulation depth. Oscillograms obtained during linearity and phase adjustments are shown in Figure 14.

ADJUSTMENT OF OUTPUT REGULATION COMPENSATION CIRCUIT

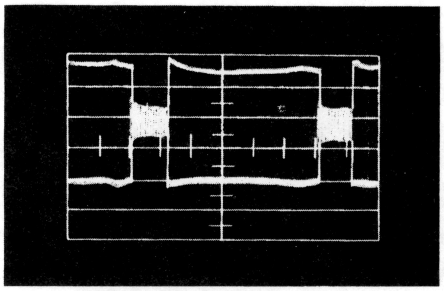
With the modulator in place and operating normally, note the reading on the VISUAL REFLECTOMETER meter(2M7) first with an all black and then with an all white picture. At best, the reading should remain constant under both conditions.

If the change in reflectometer percent power reading exceeds 14 percent (corresponding to a 7 percent change in voltage) between the two picture conditions, note which picture condition results in the higher reading. An increase in reflectometer reading with an all black picture indicates that the compensation should be reduced. Reduce the value of resistor (2R367) as necessary to achieve the desired constancy of peak power output. Conversely, if the reflectometer reading is lower with an all black picture, increase the value of 2R367.

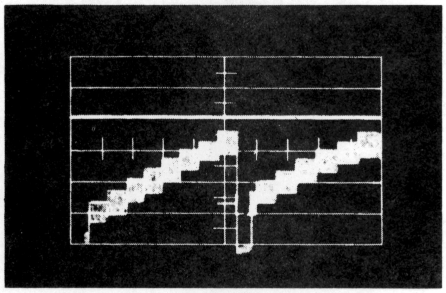
The nominal value of compensation as supplied in the modulator should result in a sufficiently constant peak power output to be within specifications. However, the amount of compensation required by a particular transmitter is dependent on many factors and is



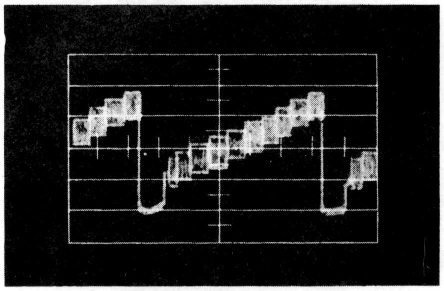
A. Output of diode demodulator after passing through high-pass filter with linearity correction off.



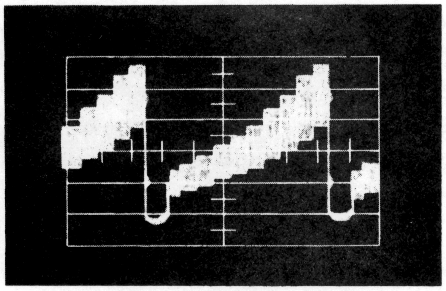
B. Output of diode demodulator after passing through high-pass filter with linearity correction on.



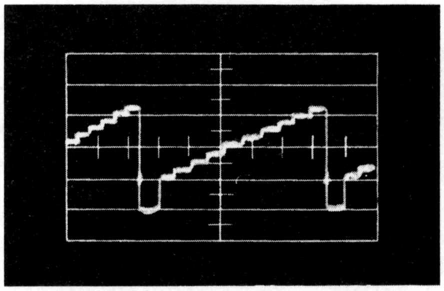
C. Output of diode demodulator direct, with linearity correction off.



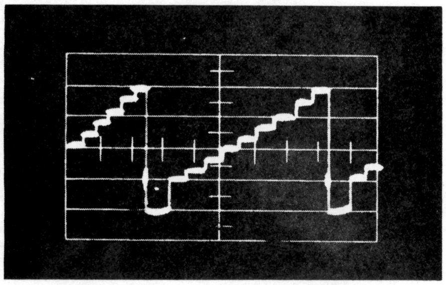
D. Output of modulator using direct probe, with linearity correction off.



E. Same as "D" except linearity correction on.



F. Output of modulator using direct probe, through low-pass filter, with linearity correction off.



G. Same as "F" except linearity correction on.

8027012-14

Figure 14. Oscillograms, Waveforms During Linearity and Phase Adjustments

rather unpredictable for a specific installation. By means of the above procedure any desired degree of constancy can be achieved.

VARIATIONS IN FREQUENCY RESPONSE WITH BRIGHTNESS

The arrangement used to observe the mid-characteristic response of the transmitter system is illustrated in Figure 12. For the various settings of the PEDESTAL LEVEL control, and with the COUPLING switch in the AC position, observe the frequency response indications that correspond to brightness levels of 22.5 percent, 67.5 percent, and mid-characteristic (peak of sync reference = 100 percent). Adjust the sweep signal of the Response Analyzer BW-5B to produce a 20-percent peak-to-peak modulation at the mid-characteristic brightness level. Maintain the same analyzer-sweep output voltage while observing the response at 22.5-percent and 67.5-percent brightness levels. Measure the variations from the mid-characteristic curve and check against the ±1.5 dB maximum allowable variation. Excessive variation may indicate insufficient swamping.

ENVELOPE DELAY

GENERAL

Envelope delay adjustments are made last because the passive networks have negligible effect on the other system characteristics. A 100 kHz square wave with a rise time of 0.05 microsecond or less is required as a test signal.

The cables used in the transmission of wide-band signals must be in good physical and electrical condition. The receiving end of the cable should be terminated in a resistance equal to the cable impedance. For best results, a line should be terminated at both the sending and receiving ends. For precise transmission, it may be necessary to employ special compensation to correct for an impedance change with frequency in a given cable.

TEST

For an overall test including the transmitter, proceed as follows:

1. Terminate output of a square-wave generator in 75 ohms ±1 percent and observe waveshape on an oscilloscope. Set bandwidth adjustment on the oscilloscope to NORMAL; square-wave repetition rate should be 100 kHz to check test signal and performance of oscilloscope. A good square-wave should be observed under these conditions.

2. Set all equalizers and the low-pass filter to OUT. Connect square-wave generator output to input of first distribution amplifier. Set signal amplitude to 0.5 volt peak-to-peak. Observe waveform at input of transmitter. Connect oscilloscope replace transmitter input, and terminate line in 75 ohms ±1 percent. If results are unsatisfactory, check one unit at a time. It is not unusual for distribution amplifiers to exhibit a very sharp overshoot, but an overshoot may be ignored since it will be removed when low-pass filter is in circuit.

3. Switch in one equalizer at a time and observe an effect on square wave as settings are varied. The only value of this test is to check the functioning of all circuits.

4. The RECEIVER EQUALIZER section of the high-frequency phase equalizer is intended only for receiver compensation and ordinarily should not be included for transmitter adjustments. However, if a demodulator having high-frequency characteristics similar to a television receiver is used, then the RECEIVER EQUALIZER section would be used in observing transmitter-delay response. This condition is simulated with fair accuracy when the BW-4B vestigial sideband demodulator is used with the sound notch in the circuit.

5. Provide R-F sampling for vestigial sideband demodulator according to the instructions supplied with the unit. Locate sampling point after sideband filter. Adjust input signal level to demodulator as directed in instruction book.

6. Connect video output from the demodulator through RG-11/U coaxial cable to input of an oscilloscope. Terminate this line with a 75-ohm ±1 percent coaxial termination.

7. Set BW-4B vestigial sideband demodulator as follows:

Control	Position
SOUND TRAP S1	OUT
PHASE COMPENSATOR S2	OUT

8. Apply a 100 kHz signal from the square-wave generator to input of the first distribution amplifier. Connect output of this amplifier to input of the first amplitude equalizer, and switch OUT variable equalizer section of high-frequency phase equalizer.

9. Energize transmitter, and adjust for ac operation at 25 percent of peak power output (mid-characteristic).

10. Modulate transmitter approximately 20 percent, and observe square-wave response on oscilloscope. Phase and amplitude errors in the demodulator must be corrected within the unit itself, if the oscilloscope presentation is to show the true transmitter response.

11. Adjust equalizer circuits for optimum square-wave response at demodulator output. The notch equalizer, part of the high-frequency phase equalizer, is used only if the antenna feed system uses a filterplexer or a notch diplexer. Otherwise, switch S3 on the equalizer should be left in the OUT position.

12. On high-frequency phase equalizer, energize VARIABLE EQUALIZER section. Adjust DELAY control for minimum ringing. Note that ten possible delay curves are available using combinations of five DELAY knob positions and VARIABLE EQUALIZER FIXED DELAY, IN-OUT switch.

13. If the envelope-delay sweep equipment is available, it may be used to obtain data on envelope delay within the operating range of the measuring equipment.

14. After completion of the preceding adjustments, switch in the RECEIVER EQUALIZER section of the high-frequency phase equalizer. With all of the required equalizers switched in, check the amplitude response at the output of the transmitter. Adjust the transmitter, if necessary, to obtain a flat response. If more than a minor adjustment is required, recheck all adjustments.

15. The overall system should now be correctly compensated for the best reproduction of color pictures on a typical receiver.

SUBCARRIER AMPLITUDE VS LUMINANCE AMPLITUDE

1. Make observation of signal waveforms on the output side of the sideband filter, using a monitoring diode, chopper, and oscilloscope. The test signal must be supplied from a colorplexer (RCA type TX-1A or TX-1B), driven by a color bar generator (RCA type WA-1D). If this signal is not available at the transmitter installation, it must be relayed from the studio control center. In either case, the test signal must not be seriously degraded before its arrival at the transmitter input. The purpose of these measurements is to detect any serious change in the relative amplitudes of luminance and subcarrier signal components. A constant ratio for each color is important in maintaining true color saturation.

2. After completing colorplexer adjustments and setting the bar generator pattern switch at the No. 4 position, measure the subcarrier maximum and minimum levels for each color at the transmitter system input. Use blanking as a reference.

3. Apply the colorplexer-composite signal to the input of the transmitter system. Make adjustments to produce full modulation at the required output power. By using the master monitor, check modulation at the transmitter output. Take measurements of subcarrier maximum and minimum levels with reference to blanking.

4. Compare corresponding color subcarrier amplitude of transmitter system input signal and vestigial sideband filter output. Departures of the latter should not exceed ±10 percent.

5. Check the corresponding color luminance levels (centers of subcarrier amplitudes) with reference to blanking to detect any appreciable departures due to the overall system.

BURST VS SUBCARRIER PHASE

1. With the transmitter system properly adjusted, measure the phase angles of each color subcarrier at both the transmitting system input and vestigial sideband filter output, using a Color Signal Analyzer, RCA type WA-6B or Vectorscope.

2. The reference 3.58 MHz subcarrier signal for the analyzer may be obtained from a Burst Controlled Oscillator, RCA type WA-4A, which in turn is controlled by a burst signal derived from the composite color or colorplexed signal arriving at the transmitter.

3. The monitoring diode signal from the sideband filter output is used to control the burst oscillator and enables the phase measurements to be made.

4. Compare the corresponding color phase angles of the transmitter system input signal and the sideband filter output. The differences should not exceed ±5 degrees. These measurements indicate the fidelity of the color hues.

OPERATION

The information in the following paragraphs contain operating instructions for the TT-6EL Transmitting Equipment. The information includes starting and stopping procedures, monochrome instructions, emergency instructions, color instructions, and overload and power instructions.

STARTING AND STOPPING THE TRANSMITTER

The TRANSMITTER ON/AIR ON pushbutton switch (1S13) is the control necessary to start the transmitter. The TRANSMITTER OFF pushbutton switch (1S14) when pressed stops the operation of the transmitter. All other circuit breakers and switches may be left ON during each shutdown. The SINGLE TRIP/MULTIPLE TRIP switch (1S7) should always be set to the MULTIPLE TRIP position during normal operation.

To interrupt transmission for a short interval, press PLATE OFF pushbutton switch (1S17). The filament power will remain on and the transmitter will return to operation immediately when the PLATE ON pushbutton (1S16) is pressed. Table 22 presents a step-by-step procedure for manually starting the transmitting equipment.

The crystal heater circuits may be operated 24 hours a day regardless of the operating schedule. However, the power to the crystal heaters may be removed at the end of the operating period providing power is applied to the heaters at least 30 minutes before the transmitter is energized.

When the equipment includes a TTC-5B Control Console, the TRANSMITTER ON/AIR ON and the PLATE switches should be operated as required by the interconnection method.

MONOCHROME OPERATION

At startup, and at regular intervals during operation, the panel meter readings should be recorded in a log. A record of this kind will disclose irregularities and gradual changes that indicate the need for tube replacement or other corrective action. Refer to Table 19 for typical panel meter readings. During routine monochrome operation the selection of desired sound or picture circuits for monitoring is done by pushbutton control on the console. Other controls on the console provide gain regulation of the audio and video input levels.

To check the picture-signal characteristics of monochrome, a CRO and picture monitor, such as in the TTC-5B console, are needed. These items will display the relative component values of signal voltages, and they will aid in keeping the voltages within the prescribed limits. The waveform illustration (see Figure 15) is a reproduction of the scale on the Waveform Monitor in the TTC-5B Control Console.

The following transmission characteristics should be monitored continuously:

1. Sync Ratio

The need for a closely maintained standard of sync amplitude and sync ratio cannot be overemphasized.

TABLE 22. MANUAL STARTING PROCEDURE

Step	Procedure	Components or Circuits Energized	Indication
1	Set all circuit breakers and switches to OFF except exciter OVERLOAD S104 switch.	---	---
2	Close Safety switch (1S3) and transmitter enclosure door.	---	---
3	Set AC MAIN LINE circuit breaker (11S1) to ON.	Line voltage applied to transmitting equipment.	Neon lamps (11I3 and 11I4) light. Meter 1M2 will indicate line voltage.
4	Set CONTROL circuit breaker (1S1) to ON.	Line voltage applied to transformer 1T1 which supplies control ladder circuits.	INTERLOCKS (1I1), TRANSMITTER OFF (1I4), and PLATE OFF (1I7) indicator lamps light.
5	TRANSMITTER ON/AIR ON pushbutton switch (1S13)	Blower motor starter (1K1) is energized.	TRANSMITTER OFF (1I4) indicator lamp goes off.
	— — —	Air interlock switch (2S9) closes when Blower (10B1) reaches operating speed.	TRANSMITTER ON/AIR ON (1I3), FILAMENT ON (1I2), and Caution (12I1) indicator lamps light.
	— — —	Filament contactor (1K2) is energized through air interlock switch.	— — —
	— — —	High voltage shorting relay (12K1) is energized removing ground from high voltage bus.	— — —
6	Set AUXILIARY circuit breaker (11S2) to ON.	Line voltage applied to line regulator 10VR1.	Regulated voltage can be metered on 1M2.
7	Set FILAMENT switch (1S2) to ON.	Plate time-delay relay (1K3) is energized and closes after 25 to 40 seconds.	PLATE READY (1I5) indicator lamp lights.
	— — —	FILAMENT HOURS meter (1M4) begins operating.	— — —

TABLE 22. MANUAL STARTING PROCEDURE (Continued)

Step	Procedure	Components or Circuits Energized	Indication
8	Press PLATE ON pushbutton switch (1S16).	Bias and modulator contactor (1K4) is energized supplying power to BIAS (1S5) and MODULATOR (1S6) switches.	PLATE OFF (1I7) and Caution (12I1) lamps go off.
9	Set MODULATOR switch (1S6) to ON.	Power is applied to modulator rectifier. Bias and modulator auxiliary relay 1K5 is energized (providing interlocks are closed and exciter AFC has locked in.	---
		Plate contactor (11K1) is energized through relay 1K5 contacts supplying power to high voltage rectifier.	PLATE ON (1I6) indicator lamp and High Voltage On (red lamps) (11I1 and 11I2) light.
		Low voltage contactor (1K6) is energized through relay 1K5 contacts supplying power to LOW VOLTAGE (1S3) switch.	
10	Set LOW VOLTAGE switch (1S3) to ON.	Power is applied to low voltage rectifier.	Transmitter is fully on.

NOTE: A thermal overload, such as 1HR1, may trip and prevent closing of associated contactors. To reset, push red button on thermal element.

2. White Level

If the sync pulse amplitude is correct but the picture whites are driven beyond the proper modulation depth, adjustment should be made immediately at the studio.

The BW-4B vestigial sideband demodulator will be energized whenever the monitoring equipment is in operation. The chopper circuit will enable the operator to observe the modulation depth on a waveform monitoring oscilloscope. The signal fed to the oscilloscope is reduced to zero for short intervals by the action of the chopper. During the intervals of zero signal, the CRO trace will be deflected beyond reference white and will produce a reference which represents zero visual signal output. The chopper will produce a horizontal white bar on the monitor kinescope and may cause the picture to tear out horizontally.

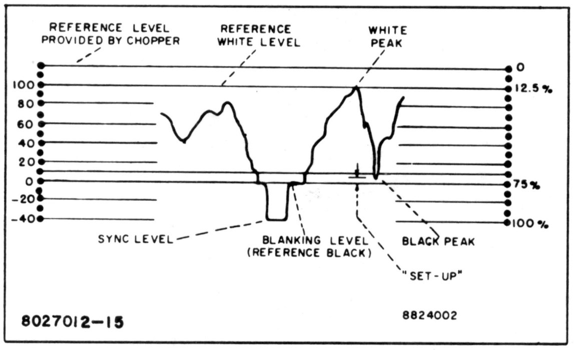


Figure 15 — Typical Signal Waveform, Monochrome

EMERGENCY OPERATION—AFC FAILURE

During normal operation the frequency-control crystals and afc circuits of the exciter maintain the output frequencies within FCC limits. Under emergency conditions the aural carrier frequency may be manually controlled by selecting the MANUAL position of the exciter AFC/MANUAL switch. Set OFF FREQ INTLK BYPASS switch (1S8) to disable the off-frequency interlock circuit. Any aural-frequency drift can be corrected by adjusting the small knob that extends from the front of transformer (2T103). The visual-carrier frequency is crystal controlled and does not require a circuit adjustment.

Any failure in the automatic-frequency-control circuits will cause the off-frequency interlock circuit to operate. As a result, all plate voltages will be removed from the transmitter, and the associated alram circuit, if connected, will be energized. If the crystal controlling the visual frequency fails, the spare oscillator position of the OSC SELECTOR switch on the exciter chassis should be selected. If the crystal is not causing the fault, bypass the frequency interlock circuit and restore plate power by following the instructions in the preceding paragraph.

COLOR OPERATION

During color programming, certain adjustments should be made frequently and systematically to obtain the most satisfactory color transmission. Various steps in maintaining optimum operating conditions are given in Table 23. If the linearity correction of the transmitter is not maintained, the chrominance information will become distorted, resulting in incorrect saturation and brightness of the picture. Additional transmitter adjustments, once the proper linearity corrections have been established, should only be made to restore previously established linearity. Even though the peak power of the transmitter may drift slightly, frequent excitation adjustments to restore the correct power is not good practice.

TABLE 23. SYMPTOMS AND REMEDIES FOR OPTIMUM COLOR OPERATION

Component	Symptom	Remedy
a. Modulation level out of modulated stage	Shifted	Return R-F excitation to proper amplitude by means of EXCITATION control. Power output should return to normal.
*b. R-F excitation amplitude	Shifted	
c. Modulator output level	Unchanged	
a. Modulation level out of modulated stage	Shifted	Adjust VIDEO GAIN control for correct modulator output level.
*b. R-F excitation amplitude	Unchanged	
c. Peak power output	Changed	
d. Modulator output level	Shifted	

*The SWAMPING indication is also an indication of R-F excitation.

The reference white level as registered on the console master monitor must be true white. Some of the chrominance signals may extend beyond the reference white, depending upon the particular hue and saturation. The operator should coordinate his observations of program-signal with the studio control and other sources, such as a color monitor, to insure a true white signal.

The Picture Monitor TM-19 in the TTC-5B Control Console is designed to give an accurate presentation of color signals and luminance picture information. Carefully observe the burst signal and other subcarrier components. Due to a possible extension of the color-signal components into the "whiter-than-white" region, such components may require attenuation with IRE roll-off characteristic when checking the white level.

Using the picture monitor, the operator should be able to make rapid observations of the input signal, the modulated-amplifier output, and the transmitter output (demodulator output). The input to the color-picture monitor may be patched at the respective circuit points to permit correlation of the color-picture observations with the master monitor presentations.

The vestigial sideband demodulator serves two purposes. As a monitoring device, it accurately simulates the response of a typical color receiver; thus, it gives the operator an indication of the signal and the quality of the picture that is transmitted to home receivers.

For monitoring service, the delay and amplitude response characteristics of the demodulator correspond to those present in a color receiver. The delay distortion correction and the excellent amplitude response of the demodulator make it an ideal measuring device when adjusting the phase equalizers to reduce phase distortion (envelope delay).

OVERLOADS AND POWER INTERRUPTIONS

If an overload occurs, one of the indicator lamps (1I11A to P) and the OVERLOAD/ O. L. RESET indicator lamp 1I8 will light. If the SINGLE TRIP/MULTIPLE TRIP switch is set to the MULTIPLE TRIP position, plate power will be removed and then will be restored in approximately one second. If the overload persists or reoccurs, power will be removed and then will be restored automatically. After the overload has been located and corrective action has been taken, press the OVERLOAD/O. L. RESET pushbutton switch. This will restore plate power and extinguish the OVERLOAD/O. L. RESET indicator lamp. By pressing the OVERLOAD LIGHTS pushbutton, the other overload lamps will go off.

Plate power will be restored immediately after any power line failure of not more than a two second duration. For momentary power line failure of two to five seconds, press the PLATE READY/T. D. BYPASS pushbutton switch on either the control unit meter panel or the control console. This action will immediately restore the filament and plate power, making it unnecessary to wait for the filament time delay relay to close. Use the PLATE READY/T. D. BYPASS pushbutton switch sparingly since tube damage may result if the power is reapplied after partial cooling of the tubes.

If a power line failure lasts for more than five seconds, the PLATE READY/T. D BYPASS pushbutton switch should not be depressed after the power has been restored until the elapsed time is approximately equal to the power off time. The PLATE READY/T. D. BYPASS pushbutton switch must be held until the PLATE READY/T. D. BYPASS indicator lamp lights.

CAUTION

Never press PLATE READY/T. D. BYPASS pushbutton switch during a startup from a cold condition of the transmitter. Damage to transmitter tubes may result.

MAINTENANCE

PERIODIC MAINTENANCE

With ordinary care, a minimum of service will be required to keep the TT-6EL transmitter in operation. To avoid interruption during programming a regular maintenance schedule should be established. Table 24 includes a recommended schedule of maintenance that can be correlated with other equipment-maintenance programs to promote overall peak efficiency.

Always open the power-line breaker and discharge the high-voltage dc circuits with a grounding stick before doing any maintenance work.

The fuses used in the various circuits for equipment protection are listed in Table 25.

MECHANICAL SERVICING

CLEANING SILVERED SURFACES

Be careful when wiping dust from any silver-plated surface as they are easily scratched. An oxidized silvered surface is a good conductor and does not require cleaning unless it becomes contaminated with some other substance. If the oxidized silver must be removed, use a nonabrasive polish, such as Wright's Silver Creme. Apply the polish over a small area at a time and carefully remove all of the polish or residue with a soft, clean, dry cloth. NEVER use a chemically treated polishing cloth. Follow the above precautions when cleaning the silver-plated surfaces of tubes.

LUBRICATION

The bearings of the blower motor are permanently lubricated and factory sealed. No additional lubrication is required. The blower, however, is equipped with ball bearings having Alemite grease fittings. Lubricant should be applied every six months while the equipment is in use. Use a high-grade, neutral, ball-bearing grease such as Keystone No. 44, Lubriko M-21, or Alemite No. 38. When lubricating the bearings, use only a low-pressure grease gun, such as Alemite No. 6650 or No. 4022, with a flexible steel hose. A high-pressure gun will rupture the grease seals. Inject grease until it just oozes from the slot in the fitting. Excessive lubrication will cause a bearing to run hot.

BLOWER SHAFT ALIGNMENT

Angular misalignment of the motor shaft may result in excessive wear of the belt drive. The motor shaft must be parallel with the blower shaft. To correct any misalignment, shim the motor as required.

Moving the motor on the mounting slots will correct for end-wise misalignment.

TABLE 24. RECOMMENDED MAINTENANCE SCHEDULE

DAILY
1. At startup, check the meter readings for the proper operating values.
2. Check regularly for proper filament voltages.
3. Make a general visual inspection for abnormalities after shutdown.
4. If overloads have occurred, examine each component concerned during shutdown and repair or replace if necessary.
WEEKLY
1. Clean the internal parts of the transmitter. Use a clean, soft cloth on all insulators and a solvent, such as trichloroethylene, where needed. A vacuum cleaner is best for removing dust or dirt; a blower will suspend dirt, allowing it to settle on the equipment again.
2. Clean the glass with tissue paper and alcohol.
3. Test the interlocks and grounding switches for proper functioning.
4. Test the operation of the overload circuits.
5. Check the output r-f circuits for evidence of heating at the connectors or junction points.
6. Inspect the air filters for clogging and replace if necessary.
7. Make a general performance check on: Aural-section noise level and distortion, and frequency characteristic. Visual-section linearity and broadband characteristics.
MONTHLY
1. Check the condition of the relay contacts and service if necessary.
2. Check the visual and aural monitoring circuits and levels.
3. Inspect the blower drive belts and adjust or replace if required.
4. Clean the blower impellers, if necessary.
QUARTERLY
1. Make a detailed inspection of every unit in the transmitter. Use any test deemed necessary.
2. Inspect and service all contactors.
3. Tighten all the connections in the transmitter.
SEMI-ANUALLY
1. Inspect the relay contacts and replace them where required.
2. Lubricate the tuning drives, gears, and blower.
3. Clean the pole faces on the contactors.

TABLE 25. FUSE SIZES AND SYMBOLS

Fuse Symbol	Fuse Size	Circuit
1F1	1 amp	Overload lights
1F2	2 amp	Relays, overload lights
1F3	1 amp	Motor-operated control circuits
1F4	2 amp	Voltage-regulator motor (if used)
1F5 to 1F10	1 amp	Regulator, input and output circuits
2F101, 2F102	1/2 amp	Crystal heaters (exciter)

TUNING DRIVES

The amplifier tuning drive system should be lubricated twice a year, or more often if any binding tendency is noted. Grease should never be used and oil should be used sparingly, because both substances collect foreign matter and cause stiffness in tuning. A dry lubricant, such as powdered molybdenum disulfide RCA stock no. 208040, is recommended. It can be mixed with either xylene or carbon tetrachloride.

RELAYS AND CONTACTORS

Periodically inspect all relays and contactors. All contacts should be cleaned and adjusted, if necessary.

Plate contactor 11K1 has contacts which do not require dressing even though severely pitted. The contacts may be cleaned with trichlorethylene and a soft cloth. Keep the pole faces clean and see that they seat securely. Manually check the operation and tighten any loose screws.

The small relays and contactors have silver-to-silver contacts that require little attention, but they may have to be replaced if tip wear becomes excessive. Filing or other methods of dressing the tips results in a loss of silver and is of no advantage so fat as operation and tip life are concerned.

Relay contacts, in general, should be cleaned with trichlorethylene applied with a soft brush, followed by burnishing with a tool such as the RCA Contact Cleaning Tool, Stock No. 22963. Finally, wipe the contacts with clean bond paper.

MAGNEHELIC METER

A reduction in the air pressure reading from that specified in table 12 indicates that one or more of the following conditions exist:

1. Clogged tubing to air pressure gauge.
2. Clogged air filter.

3. Loose blower drive belt.
4. Leak in duct work at blower boot.
5. Loose fittings on the ends of the line to the air pressure gauge.

Take the necessary corrective measures to restore the pressure.

ELECTRICAL SERVICING

TUBES

Check all tubes periodically. Tube failure can sometimes be anticipated by keeping a log of tube life and watching for signs of weakness when the log indicates the end of normal life is near. The most frequent cause of failure in low-power and receiving type tubes is a gradual loss of emission with use. Such a condition can be detected by periodic testing of all small tubes.

MODULATOR

The modulator servicing adjustments and procedures follow those used during factory testing. These adjustments are not required for a modulator that is properly functioning or during routine maintenance. If malfunctioning occurs and it cannot be corrected by following the modulator information given previously, then the material listed below should be referred to. On a previously satisfactory modulator it is only necessary to perform enough tests to locate the fault and assure proper operation. A list of servicing equipment is given in Table 26.

TABLE 26. MODULATOR SERVICING EQUIPMENT

Description	RCA Reference	Other
Oscilloscope (MI-26500-A)	TO-524-AD	
Sideband Response Analyzer	BW-5B	
Video Envelope Detector	MI-34051	
Square-wave Generator		Tektronix Model 105
Multimeter		Simpson Model 260
Linearity Checker	MI-34017	
Color Signal Analyzer	MI-34016	Tektronix Vectroscope
Capacitor, 0.1 mf, 600 volt		
Capacitor, 1 mf, 600 volt		
Capacitor, 10 mf, 600 volt		
Capacitor, 360 mf, 1200 volt, mica (dummy load for modulator output)	RCA Dwg. No. 728647-230	
Resistor, 20 ohm, 80 watt, non-inductive	Stock No. 55981	

For monitoring and especially for video sweep alignment, the test jacks listed in Table 27 are provided on the visual modulator chassis.

Video Sweep Alignment

Preliminary

1. Adjust TERMINATION ADJ 75 ohm control (2R302) for 75-ohm resistance from 2S306 to chassis ground (with no external connection to input jack 2J303).

2. Set VIDEO GAIN control (2R301) between 25 and 50 percent of full clockwise position.

3. Set HI. PEAKER AMP control (2R310) to full counterclockwise (maximum resistance) position.

4. Set LINEARITY CORRECTOR switch (2S304) to OFF position. Set LINEARITY controls A, B, C, and D to the maximum counterclockwise position.

5. Set COUPLING switch (2S303) to AC position.

TABLE 27. VISUAL MODULATOR TEST JACKS

Jack No.	Circuit	Element
J306	Video input	
J307	V301A	Cathode
J308	V301B	Cathode
J309	V302	Cathode
J310	V304	Cathode
J312	Mod Output	
J313	V326A	Cathode
J314	V326B	Plate
J315	V327A	Plate
J316	V328B	Grid
J317	V328B	Plate
J318	V329	Plate
J319	V329	Cathode
J320	V330	Plate
J321	V330	Cathode

6. Maintain sweep input signal voltage at approximately 0.5 volt peak-to-peak.

7. The response of individual stages and the overall response shall be flat ±1.0 db to 5.0 MHz and shall not rise after 5.0 MHz.

8. Terminate monitor output at 2J305 with 75 ohms.

9. Remove four lower 6146 tubes from the modulator stage (2V311, 2V312, 2V313, and 2V314).

1st Video Stage Alignment

1. Apply video sweep generator signal to video input jack 2J303.

2. Connect detector and oscilloscope to inverter stage cathode test point (2J308).

3. Connect jumper lead across inverter plate peaking coil (2L304 and 2R321).

4. Turn on plate power switch and align the first video stage by adjusting 2L301 and 2L303 for flat video response to at least 5.0 MHz. If necessary, change the value of damping resistor 2R312.

Inverter Stage Alignment

1. Remove jumper lead and connect across linearity corrector stage plate coil (2L306, 2R331, and 2R332).

2. Connect detector and oscilloscope to linearity corrector cathode test point (2J309).

3. Turn on plate power and tune inverter plate coil (2L304) for flat video response.

4. Turn off plate power.

Linearity Corrector Alignment

1. Remove jumper lead and connect across 2nd video stage peaking coils (2L307 and 2L308).

2. Connect 10 mfd capacitor from junction of 2L308 and 2R348 to ground. Set LINEARITY CORRECTOR switch (2S304) to ON.

3. Connect the detector and oscilloscope to the 2nd video stage test point (2J310).

4. Turn on plate power and tune linearity corrector stage plate coil (2L306) for flat video response. Set LINEARITY CORRECTOR switch (2S304) to OFF. Set capacitor (2C398) for a flat video response, similar to that obtained with 2S304 in ON position.

5. Turn off plate power.

2nd Video Stage Alignment

1. Remove jumper and connect across 2L310. Place a second jumper across 2L311. Do not use one jumper lead connected across both 2L310 and 2L311. Remove 10 mfd capacitor used in previous step.

2. Remove 3rd video stage plate resistors 2R372 and 2R373. Connect a low resistance (20 to 50 ohms) non-inductive resistor (power rating 10 watts or higher) in their place. The 20 ohm, 80 watt unit (stock no. 55981) specified in Table 26 may be conveniently used for this purpose.

3. Connect detector and oscilloscope across 20 ohm resistor.

4. Adjust PEDESTAL LEVEL control to maximum clockwise position to prevent plate and screen voltages from exceeding dissipation limits of 2V305 and 2V306 during this step.

Turn on plate power and adjust 2nd video peaking coils (2L307 and 2L308) for flat video response. If necessary, change the value of damping resistor (2R347).

5. Turn off plate power.

3rd Video Stage and Modulator Alignment

1. Remove jumpers and non-inductive resistor installed in previous step.

2. Replace four 6146 tubes. Replace 2R372 and 2R373.

3. Connect oscilloscope to modulator output monitoring jack 2J312.

4. Turn on plate power. Adjust PEDESTAL LEVEL control (2R488) until MOD AMPL BIAS meter 2M5 indicates -280 volts.

5. Set VIDEO GAIN control for a low frequency sweep amplitude of 100 volts peak-to-peak at 2J312.

6. Adjust 3rd video amplifier peaking coils (2L310 and 2L311) for a uniform video response to 5 MHz. Set 2C319 near minimum capacity and later adjust it in conjunction with 2L310 and 2L311 for best overall amplitude response.

High Peaker Adjustment

1. Adjust HI PEAKER AMP control (2R310) to full clockwise position.

2. Adjust HI PEAKER FREQ coil (2L302) for maximum response at 4.0 MHz.

> NOTE: The 4.0 MHz response with 2R310 at maximum clockwise position shall be at least 3 dB more than the response with 2R310 at the maximum counterclockwise position.

3. Adjust HI PEAKER AMP control (2R310) to full counterclockwise position.

Overall Alignment

Correct overall alignment is indicated by the following three conditions:

a. Overall frequency response is flat ±1 dB to 5.0 MHz.

b. Response of each individual stage is flat within ±1 dB to 5.0 MHz.

c. There are no sharp irregularities or a rising characteristic after 5.0 MHz.

1. Readjust individual stages slightly, if necessary.

2. Turn off plate power.

This completes the modulator alignment. Do not disconnect any equipment if the monitor output is to be adjusted, otherwise remove all external items.

MONITOR STAGE ADJUSTMENT

1. Set COUPLING switch 2S303 to DC. Connect oscilloscope to monitor output jack 2J305 terminates with 75 ohms. Apply a composite video signal input jack 2J303.

2. Turn on plate power. Adjust trimmer 2C344 for minimum tilt during the horizontal sync and blanking intervals at monitor output jack 2J305.

3. Apply a video sweep signal to input jack 2J303. Set 2S303 to AC and observe that response of monitor stage should be identical to that of the overall modulator response within ±2 db.

MISCELLANEOUS ADJUSTMENTS

Modulator Amplitude Capability

To establish the maximum amplitude capability, proceed as follows:

1. Check linearity and differential phase of the linearity checker. Use a signal analyzer input connected to output of linearity checker and an RCA type TO-524-AD oscilloscope.

2. Set output voltage of linearity checker to 1 volt and connect to modulator input jack 2J303. Connect modulator output to signal analyzer input through a suitable voltage divider circuit or use monitor output jack (2J305).

3. Set COUPLING switch to DC. With VIDEO GAIN set to zero, set PEDESTAL LEVEL control (2R488) until MOD AMPL BIAS meter (2M5) indicates 200 volts. Also adjust total modulator current control (2R492) for 180 mA total modulator current.

4. Adjust sync for 25% of the peak-to-peak signal amplitude without subcarrier. Then add 10% peak-to-peak subcarrier amplitude. Set LINEARITY CORRECTOR switch to ON and LINEARITY A, B, C, and D controls to zero.

5. Adjust VIDEO GAIN control for an output voltage swing of 300 volts peak-to-peak. Measure differential phase for a limit of 4 degrees.

Pedestal Level Shift

To check pedestal level shift, proceed as follows:

1. Adjust modulator for a white picture output of 300 volts peak-to-peak.

2. Switch to an all black picture without changing the sync. Pedestal level shift, as observed on an RCA type TO-524-AD oscilloscope at jack 2J312, should not exceed ±2.5%.

Clamping Adjustment

To adjust the clamping, proceed as follows:

1. Connect a composite picture input to modulator input.

2. Observe that tilt on vertical blanking interval does not exceed 2% at 200 volts peak-to-peak and 100 volts peak-to-peak.

Color Subcarrier Capability

To establish modulator color subcarrier amplitude capability, proceed as follows:

1. Set LINEARITY CORRECTOR switch to OFF, COUPLING switch to DC, pedestal level at -200 volts, and total modulator current to 180 mA with VIDEO GAIN at zero.

2. Apply a linearity checker test signal to modulator input jack (2J303). Adjust modulator VIDEO GAIN for 170 volts peak-to-peak output at modulator output jack (2J304). Reduce linearity checker step amplitude and increase 3.58 MHz subcarrier amplitude to obtain 170 volt peak-to-peak output with 85 volt peak-to-peak subcarrier swing.

3. With a suitable input signal, maximum 3.58 MHz signal capability should not be less than 85 volts peak-to-peak. Input signal should be so proportioned, by linearity checker adjustment, that total peak-to-peak excursion, including 3.58 MHz component, is 170 volts peak-to-peak. Subcarrier amplitude should be adjusted for 85 volts peak-to-peak on each step.

4. Check differential gain for a 15% maximum limit and differential phase for a limit of 4 degrees.

Square Wave Response

To check modulator square-wave response, proceed as follows:

1. Set COUPLING switch to AC, connect a square-wave generator to modulator input, and adjust generator for 100 kHz wave and an output of 180 volts peak-to-peak for modulator.

2. Measured between 10% and 90% levels, rise time should not exceed 0.09 microsecond; overshoots should be symmetrical and should not exceed 15%.

TUBE SOCKET VOLTAGES

The exciter and modulator tube socket voltages are given in Tables 28 through 31.

CONTROL CIRCUITS TROUBLESHOOTING

The step-by-step manual starting procedures provided in Table 22 should be used to service and to check the basic operation of the TT-6EL control circuits. A thorough understanding of the procedure will enable one to better understand the operation and also to service the circuits when defective.

TABLE 28. TYPICAL VOLTAGES, EXCITER TUBE SOCKETS

CONDITIONS: All dc measurements made with a 20,000 ohm-per-volt meter, or equivalent.
All voltages dc unless otherwise noted.

Tube Symbol	*Tube Type*	*Pin Numbers*								
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
2V101	6V6	0	0	150[1]	150	*	NC	6.3 dc	15	—
2V102	6V6	0	0	150[1]	150	*	NC	6.3 dc	15	—
2V103	6V6	0	0	150[1]	35	*	NC	6.3 dc	0	—
2V104	5763	300[2]	NC	8.5	0	6.0 dc	250	8.5	*	*
2V105	5763	300[3]	NC	9.5	0	6.0 ac	250	9.5	*	*
2V106	5763	300[4]	NC	9.5	0	6.0 ac	250	9.5	*	*
2V107	5763	300[5]	NC	10	0	6.0 ac	250	10	*	*
2V108	6AS6	*	2	6.3 ac	0	170[6]	120	*	—	—
2V109	6AS6	*	2	6.3 ac	0	160[7]	105	*	—	—
2V110	6AQ5	*	2	6.3 ac	0	100[8]	65	*	—	—
2V111	6AC7	0	0	95[9]	*	0	95[9]	6.3 ac	95[9]	—
2V112	6AC7	0	0	95[10]	*	0	95[10]	6.3 ac	95[10]	—
2V113	6AC7	0	0	95[11]	*	0	95[11]	6.3 ac	95[11]	—
2V114	6J6	65[12]	65[12]	6.3 ac	0	*	*	0	—	—
2V115	6AC7	0	0	95[13]	*	95[13]	95[13]	6.3 ac	95[13]	—
2V116	6AC7	0	0	95[14]	*	0	95[14]	6.3 ac	95[14]	—
2V117	6AC7	0	0	95[13]	*	0	95[15]	6.3 dc	95[15]	—
2V118	12AT7	225	*	4	0	0	225	*	4	6.3 dc
2V119**	6AK5	*	0.7	6.3 ac	0	145	75	0.7	—	—
2V120**	6AK5	*	6	6.3 ac	0	150	150	6	—	—
2V121	5763	300[16]	NC	7.5	0	6.0 ac	250	7.5	*	*
2V122	5763	300[17]	NC	9	0	6.0 ac	250	9	*	*
2V123	5763	300[18]	NC	9	0	6.0 ac	250	9	*	*
2V124	5763	300[19]	NC	10	0	6.0 ac	250	10	*	*
2V125	5763	300[20]	NC	11	0	6.0 ac	250	11	*	*
2V126	0D3	NC	3	NC	NC	150	NC	NC	NC	—
2V127	2D21	0	6	6.3 ac	0	6	125[21] ac	6	—	—
2V128	6AS6	0	2.5	6.3 ac	0	140	70	*	—	—

*DO NOT MEASURE.

**Measured with 2V119 (Osc. No. 1) operating. 2V119 and 2V120 readings will be interchanged when 2V120 (Osc. No. 2) is operating.

[1] Measure at terminal E of 2T103.
[2] Measure at terminal A of 2L103.
[3] Measure at terminal A of 2L104.
[4] Measure at 2C133.
[5] Measure at 2C143.
[6] Measure at terminal A of 2L109.
[7] Measure at terminal D of 2L110.
[8] Measure at terminal D of 2L111.
[9] Measure at terminal A of 2T104.
[10] Measure at terminal A of 2T105.
[11] Measure at terminal A of 2T106.
[12] Measure at terminal D of 2L112.
[13] Measure at terminal A of 2T108.
[14] Measure at terminal A of 2T109.
[15] Measure at terminal A of 2T110.
[16] Measure at terminal C of 2L118.
[17] Measure at terminal C of 2L119.
[18] Measure at terminal C of 2L120.
[19] Measure at terminal 2C258.
[20] Measure at terminal 2C261.
[21] Measure to cathode (pin 2).

TABLE 29. TYPICAL TUBE SOCKET VOLTAGES, MODULATOR MI-34471-A MONOSCOPE TEST PATTERN

Symbol	*Tube Type*	*Pin No.*									
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*Cap*
V301	6CX8	+2.2	+1.1	+148	0	6.3 ac	+2.9	0	+140	+228	
V302	6CL6	+6.9	*	+148	6.3 ac	0	+240	+6.9	+148	*	
V303											
V304	6CL6	+2.8	+0.6	+148	6.3 ac	0	+168	+2.8	+148	+0.6	
V305	5933	−575	−328	*	−570	−575					−350
V306	5933	−575	−328	*	−570	−575					−350
V307	5651	−346	−430	*	−430	−346	*	−430			
V308	6146	−347	−347	−130	−347	−383	−347	−347	NC		−11.5
V309	6146	−347	−347	−130	−347	−383	−347	−347	NC		−11.5
V310	6146	−347	−347	−130	−347	−383	−347	−347	NC		−11.5
V311	6146	−575	−575	−370	−575	−620	−575	−575	NC		−348
V312	6146	−575	−575	−370	−575	−620	−575	−575	NC		−348
V313	6146	−575	−575	−370	−575	−620	−575	−575	NC		−348
V314	6146	−575	−575	−370	−575	−620	−575	−575	NC		−348
V315	6CL6	+3.6	0	+153	6.3 ac	0	+153	+153	+153	0	
V316	0B2	−130	−238	*	−238	−130	*	−238			
V317	0B2	−238	−347	*	−347	−238	*	−347			
V318	0B2	−130	−238	*	−238	−130	*	−238			
V319	0B2	−238	−347	*	−347	−238	*	−347			
V320	0B2	−130	−238	*	−238	−130	*	−238			
V321	0B2	−238	−347	*	−347	−238	*	−347			
V322	0B2	−370	−473	*	−473	−370	*	−473			
V323	0B2	−473	−575	*	−575	−473	*	−575			
V324	0B2	−370	−473	*	−473	−370	*	−473			
V325	0B2	−473	−575	*	−575	−473	*	−575			
V326	6CX8	+47	+46	+155	0	6.3 ac	+12.5	+9.7	+150	+160	
V327	6EA8	NC	−9.6	+15	6.3 ac	0	+249	0	NC	NC	
V328	6EA8	+65	−0.8	+116	6.3 ac	0	+150	0	+0.7	+0.7	
V329	6CL6	+4.6	0	+82	6.3 ac	0	+112	+4.6	+82	0	
V330	6CL6	+6.8	0	+112	6.3 ac	0	+154	+6.8	+112	0	
V331	6AL5	*	*	0	6.3 ac	+3.2	0	−3.2			
V332	6AL5	*	*	−575	−575	−545	−575	−622			
V333	6AS7-G	+234	+332	+254	+234	+332	+254	+249	+249		
V334	6AS7-G	+234	+332	+254	+234	+332	+254	+249	+249		
V335	6SL7-GT	+124	+234	+125	+83	+124	+85	−0.4	−0.4		
V336	0D3	NC	+2.9	+150	NC	+150	NC	+150	NC		
V337	5651	+85	0	*	0	+85	*	0			
V338	6336-A	−35	+148	+2.7	−35	+148	+2.7	+4.6	+4.6		
V339	6336-A	−35	+148	+2.7	−35	+148	+2.7	+4.6	+4.6		
V340	6SL7-GT	−418	−35	−421	−630	−418	−525	−525	−525		
V341	0A2	−421	−575	*	−575	−421	*	−575			
V342	0C3	NC	−426	NC	NC	−328	NC	NC	NC		
V343	0C3	NC	−575	NC	NC	−427	NC	NC	NC		
V344	0C3	NC	−681	NC	NC	−575	NC	NC	NC		

CONDITIONS: Monoscope Test Pattern
Vis. Mod. Ampl. Bias—347V
Total Modulator Current—132 ma
Video Output—300V (p-p)
Coupling—DC
RF Excitation—Off
Linearity Correction—Off
*Do Not Measure
NC—No Connection
Measured with an RCA VoltOhmyst WV-98A

NOTE: Before taking readings set PEDESTAL LEVEL control for VIS. MOD. AMPL. BIAS of 200 volts and TOTAL MOD. CURRENT control for TOTAL MODULATOR CURRENT of 180 ma, both with no input signal. Then apply input signal and set VIDEO GAIN for 300 volts peak-to-peak output.

TABLE 30. TYPICAL TUBE SOCKET VOLTAGES, MODULATOR MI-34471-A, NO SIGNAL

Symbol	*Tube Type*	*Pin No.*									
		1	2	*3*	*4*	*5*	6	7	8	9	*Cap*
V301	6CX8	+2.2	+1.1	+148	0	6.3 ac	+2.9	0	+140	+228	
V302	6CL6	+6.9	+1.7	+148	6.3 ac	0	+240	+6.9	+148	+1.7	
V303											
V304	6CL6	+2.8	+0.6	+148	6.3 ac	0	+168	+2.8	+148	+0.6	
V305	5933	−575	−319	−580	−570	−575					−194
V306	5933	−575	−319	−580	−570	−575					−194
V307	5651	−192	−282	*	−282	−192	*	−282			
V308	6146	−200	−200	+8.5	−200	−235	−200	−200	NC		−17
V309	6146	−200	−200	+8.5	−200	−235	−200	−200	NC		−17
V310	6146	−200	−200	+8.5	−200	−235	−200	−200	NC		−17
V311	6146	−575	−575	−368	−575	−620	−575	−575	NC		−202
V312	6146	−575	−575	−368	−575	−620	−575	−575	NC		−202
V313	6146	−575	−575	−368	−575	−620	−575	−575	NC		−202
V314	6146	−575	−575	−368	−575	−620	−575	−575	NC		−202
V315	6CL6	+3.6	0	+153	6.3 ac	0	+153	+153	+153	0	
V316	0B2	+8.5	−96	*	−96	+8.5	*	−96			
V317	0B2	−96	−200	*	−200	−96	*	−200			
V318	0B2	+8.5	−96	*	−96	+8.5	*	−96			
V319	0B2	−96	−200	*	−200	−96	*	−200			
V320	0B2	+8.5	−96	*	−96	+8.5	*	−96			
V321	0B2	−96	−200	*	−200	−96	*	−200			
V322	0B2	−368	−471	*	−471	−368	*	−471			
V323	0B2	−471	−575	*	−575	−471	*	−575			
V324	0B2	−368	−471	*	−471	−368	*	−471			
V325	0B2	−471	−575	*	−575	−471	*	−575			
V326	6CX8	+47	+46	+155	0	6.3 ac	+3.0	0	+150	+157	
V327	6EA8	NC	−0.4	+15	6.3 ac	0	+247	0	NC	NC	
V328	6EA8	+62	−0.6	+115	6.3 ac	0	+150	0	+0.7	+0.8	
V329	6CL6	+4.5	0	+79	6.3 ac	0	+109	+4.5	+79	0	
V330	6CL6	+6.5	0	+118	6.3 ac	0	+160	+6.5	+118	0	
V331	6AL5	+1.8	+1.8	0	6.3 ac	+150	0	−132			
V332	6AL5	−580	−580	−575	−575	−319	−575	−680			
V333	6AS7-G	+228	+334	+256	+228	+334	+256	+248	+248		
V334	6AS7-G	+228	+338	+256	+228	+334	+256	+248	+248		
V335	6SL7-GT	+123	+228	+124	+83	+123	+84	0	0		
V336	0D3	NC	+2.7	+151	NC	+151	NC	+151	NC		
V337	5651	+85	0	*	0	+85	*	0			
V338	6336-A	−32	+142	+3.0	−32	+142	+3.0	+4.2	+4.2		
V339	6336-A	−32	+142	+3.0	−32	+142	+3.0	+4.2	+4.2		
V340	6SL7-GT	−427	−32	−428	−630	−427	−530	−530	−530		
V341	0A2	−428	−575	*	−575	−428	*	−575	−575		
V342	0C3	NC	−424	NC	NC	−319	NC	NC	NC		
V343	0C3	NC	−575	NC	NC	−424	NC	NC	NC		
V344	0C3	NC	−680	NC	NC	−575	NC	NC	NC		

CONDITIONS: No Signal
Video Gain—Zero
Vis. Mod. Ampl. Bias—200V
Total Mod. Current—180 ma
Coupling—AC
RF Excitation—Off
Linearity Corrector—Off
*Do Not Measure
Measured with an RCA VoltOhmyst WV-98A

TABLE 31. TYPICAL TUBE SOCKET RESISTANCES, MODULATOR MI-34471-A

Symbol	*Tube Type*	*Pin No.*									
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*Cap*
V301	6CX8	200	470K	6.2K	0	0	100	390K	7.8K	4.5K	
V302	6CL6	1000	150K	5.2K	0	0	5.4K	1000	5.2K	150K	
V303											
V304	6CL6	62	470K	5.2K	0	0	5.9K	62	5.2K	470K	
V305	5933	100K	6.9K	330K	112K	100K					2.0K
V306	5933	100K	6.9K	330K	112K	100K					2.0K
V307	5651	2.0K	290K	NC	290K	2.0K	NC	290K			
V308	6146	210K	210K	1 meg	210K	210K	210K	210K	NC		330
V309	6146	210K	210K	1 meg	210K	210K	210K	210K	NC		330
V310	6146	210K	210K	1 meg	210K	210K	210K	210K	NC		330
V311	6146	100K	100K	9.6K	100K	126K	100K	100K	NC		210K
V312	6146	100K	100K	9.6K	100K	126K	100K	100K	NC		210K
V313	6146	100K	100K	9.6K	100K	126K	100K	100K	NC		210K
V314	6146	100K	100K	9.6K	100K	126K	100K	100K	NC		210K
V315	6CL6	150	1 meg	1 meg	0	0	1 meg	1 meg	1 meg	1 meg	
V316	0B2	1 meg	INF	NC	INF	1 meg	NC	INF			
V317	0B2	INF	210K	NC	210K	INF	NC	210K			
V318	0B2	1 meg	INF	NC	INF	1 meg	NC	INF			
V319	0B2	INF	210K	NC	210K	INF	NC	210K			
V320	0B2	1 meg	INF	NC	INF	1 meg	NC	INF			
V321	0B2	INF	210K	NC	210K	INF	NC	210K			
V322	0B2	9.6K	INF	NC	INF	9.6K	NC	INF			
V323	0B2	INF	100K	NC	100K	INF	NC	100K			
V324	0B2	9.6K	INF	NC	INF	9.6K	NC	INF			
V325	0B2	INF	100K	NC	100K	INF	NC	100K			
V326	6CX8	15.5K	485K	5.4K	0	0	100	470K			
V327	6EA8	NC	470K	5.9K	0	0	6.3K	0			
V328	6EA8	31K	150K	14.7K	0	0	5.2K	0	100		
V329	6CL6	4750	0	170K	0	0	19.2K	4750	170K	0	
V330	6CL6	4750	0	220K	0	0	69K	4750	220K	0	
V331	6AL5	150K	150K	0	0	105K	0	225K			
V332	6AL5	330K	330K	100K	100K	107K	100K	217K			
V333	6AS7-G	1.45 meg	900K	3.5K	1.45 meg	900K	3.5K	103K	103K		
V334	6AS7-G	1.45 meg	900K	3.5K	1.45 meg	900K	3.5K	103K	103K		
V335	6SL7-GT	450K	1.45 meg	11.6K	1.1 meg	450K	9.0K	INF	INF		
V336	0D3	NC	100	5.2K	NC	5.2K	NC	5.2K	NC		
V337	5651	1.0 meg	0	NC	0	1.0 meg	NC	0			
V338	6336-A	330K	280K	20	330K	280K	20	INF	INF		
V339	6336-A	330K	280K	20	330K	280K	20	INF	INF		
V340	6SL7-GT	1.0 meg	330K	38K	380K	1.0 meg	110K	110K	110K		
V341	0A2	38K	100K	NC	100K	38K	NC	100K			
V342	0C3	NC	INF	NC	NC	6.9K	NC	NC	NC		
V343	0C3	NC	100K	NC	NC	INF	NC	NC	NC		
V344	0C3	NC	117K	NC	NC	100K	NC	NC	NC		

CONDITIONS: All measurements taken between tube socket pin and ground unless otherwise noted
Measured with an RCA VoltOhmyst WV-98A
Video Gain—Zero
Coupling—AC
Linearity Corrector—Off
Power—Off
NC—No Connection
INF—Infinite Resistance

WAVEFORMS

The waveforms shown in Figure 16 were made with an input signal of 0.7 volt peak-to-peak. The signal contained 0.5 volt composite video and 0.2 volt sync.

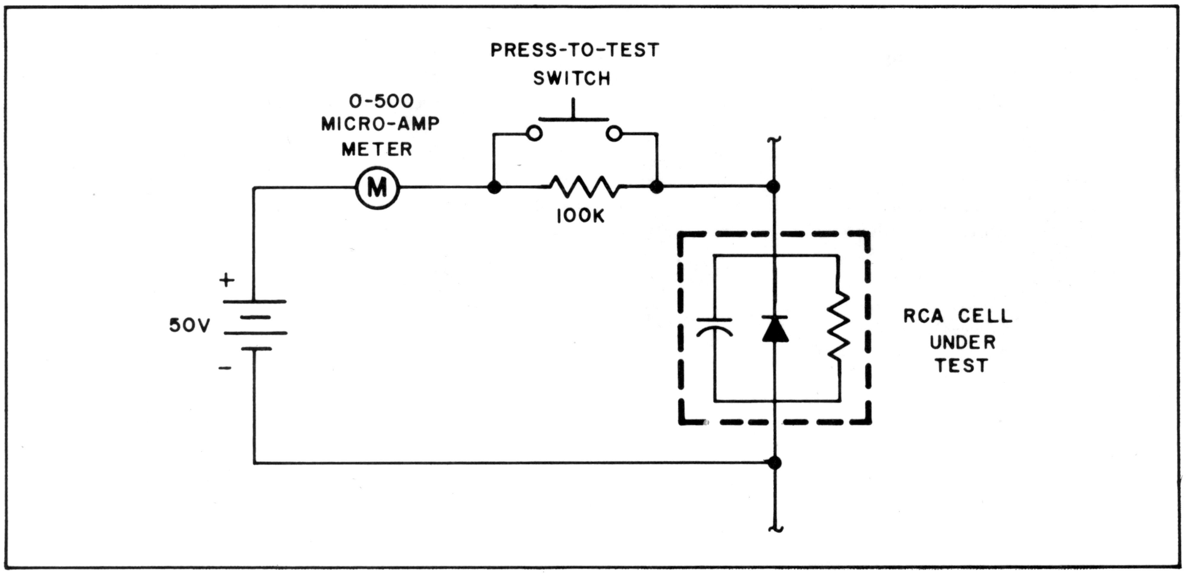
All composite waveform photographs were made with the use of TO-524-AD oscilloscope using a 10X low capacity input probe. The oscilloscope vertical amplifier BANDWIDTH switch was set to NORMAL to obtain the best transient response.

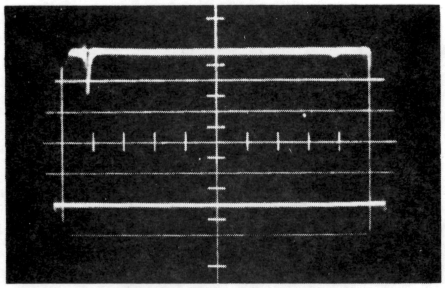
Sweep response photographs were taken using either a TO-524-AD oscilloscope using a 10X low capacity probe and with the vertical amplifier BANDWIDTH switch set to FLAT or an MI-34051 video detector connected to the oscilloscope vertical input. All waveforms were taken between the point of observation and ground.

HIGH VOLTAGE SILICON RECTIFIER STACKS

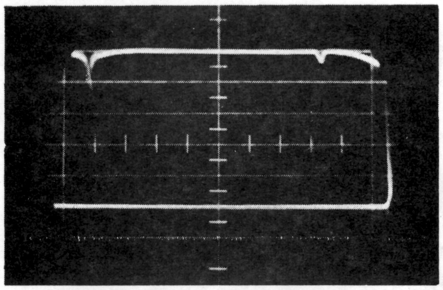
The condition of individual cells in the RCA CR1A and B through CR6A and B series stacks mounted on the rectifier panel may be checked by applying an external voltage to the individual cells and measuring the resultant current flow through the cell. A simple test circuit as shown below, can be used to perform the individual cell checks. It should be noted that some other value of voltage can be used in the test circuit; however, 50 volts was selected because it is low enough to be safe for testing, but is also sufficient to present a good indication of cell degradation. A lower voltage, such as that available in a vacuum-tube voltmeter, will not isolate defective cells unless they are almost complete shorts. Also note that the 100 kilohm resistor and the "press-to-test" switch have been included in the test circuit to protect the meter from shorted and incorrectly connected (reversed) diodes.

Connect the test circuit across the cell to be tested observing the polarity as shown in the diagram. It should be noted that an area on each of the fins of a rectifier stack has been left unpainted to facilitate this connection. When the "press-to-test" switch is activated, a good cell will provide an indication of approximately 100 microamperes, while a cell that has degraded will indicate several hundred microamperes.

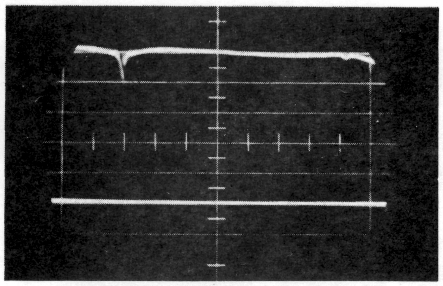




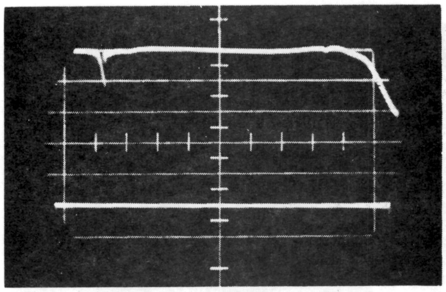
1. Sweep Signal Input at J303; Marker at 5 Mc



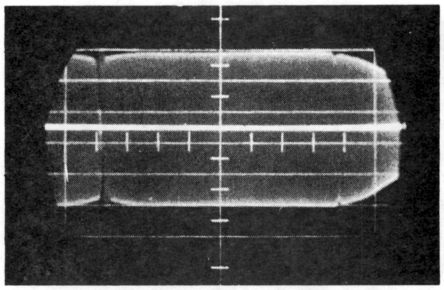
2. Amplitude Response at Plate of 1st Video Ampl V301A; Marker at 5 Mc



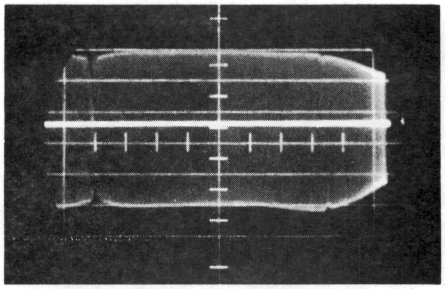
3. Amplitude Response at Plate of Inverter Ampl V301B; Marker at 5 Mc



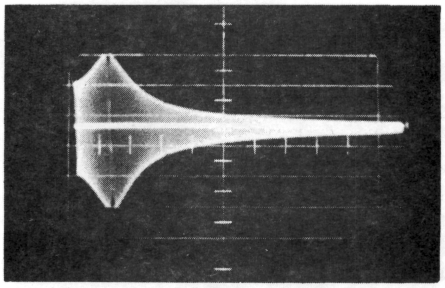
4. Amplitude Response at Plate of Lin Corrector Ampl V302; Marker at 5 Mc



5. Amplitude Response at Plate of 2nd Video Ampl V304; Marker at 5 Mc



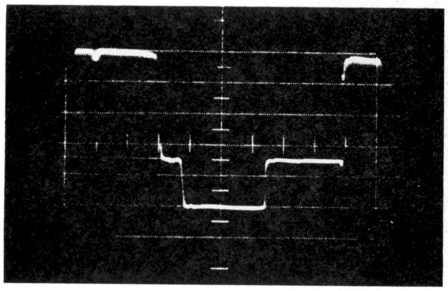
6. Amplitude Response at Modulator Output Jack J304; 100 Volts Peak to Peak; Marker at 5 Mc



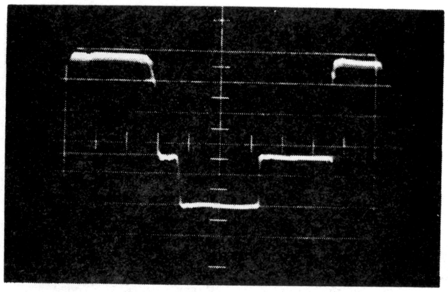
7. Amplitude Response at Plate of Sync Ampl V326B; Marker at 1 Mc

8027012-16A

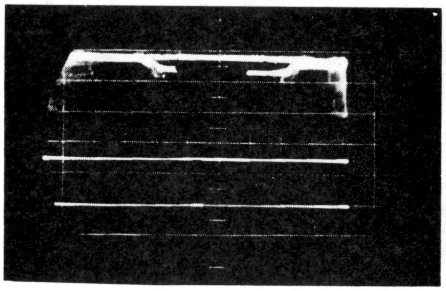
Figure 16—Oscillograms, Waveforms of Visual Modulator MI-34471-A (Sheet 1 of 6)



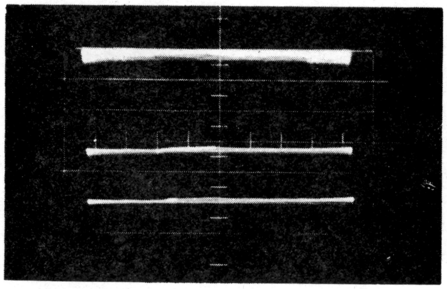
8. Composite Video Input at J303; Monoscope Test Pattern at Line Rate Horizontal Sweep Speed



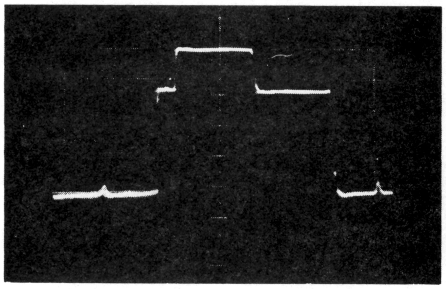
12. Plate of Inverter Ampl V301B; 3.2 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed



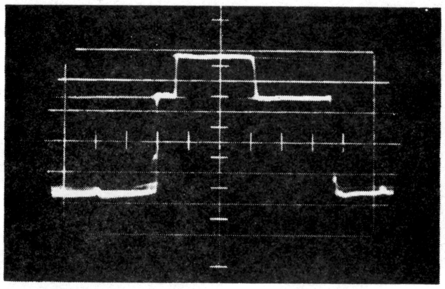
9. Composite Video Input at J303; Monoscope Test Pattern at 60-Cycle Horizontal Sweep Speed



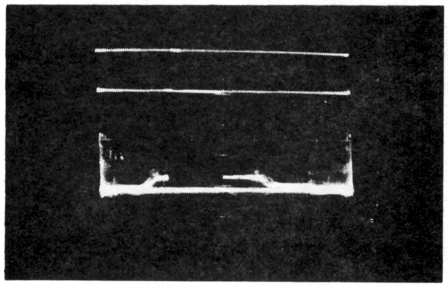
13. Plate of Inverter Ampl V301B; 3.2 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



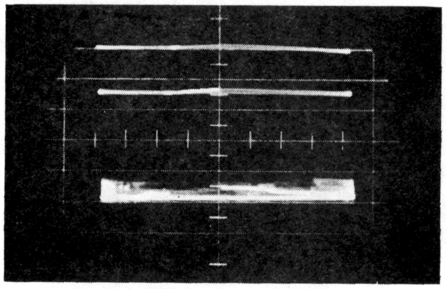
10. Plate of 1st Video Ampl V301A; 1.7 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed



14. Plate of Linearity Corrector Ampl V302; 2.8 Volts Peak to Peak at Line Rate Horizontal Sweep Speed



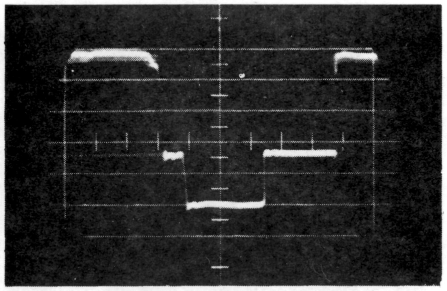
11. Plate of 1st Video Ampl V301A; 1.7 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



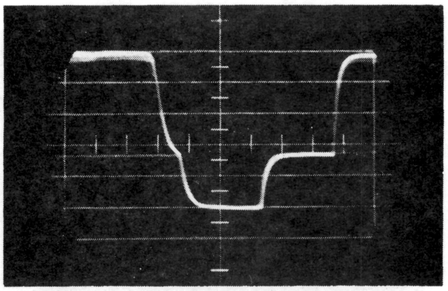
15. Plate of Linearity Corrector Ampl V302; 2.8 Volts Peak to Peak at 60-Cycle Horizontal Sweep Speed

8027012-16B

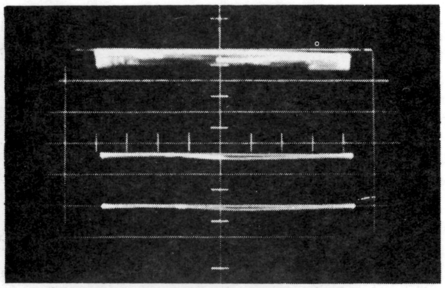
Figure 16—Oscillograms, Waveforms of Visual Modulator MI-34471-A (Sheet 2 of 6)



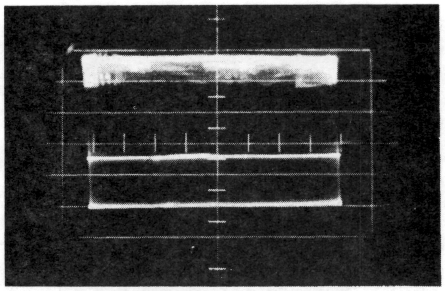
16. Plate of 2nd Video Ampl V304;
23 Volts Peak to Peak; at Line Rate
Horizontal Sweep Speed



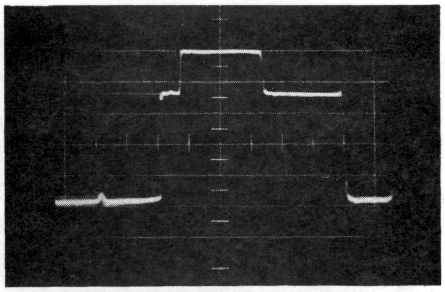
20. Cathode of Sync Cath. Follower
V326A (J313); 3 Volts Peak to Peak;
at Line Rate Horizontal Sweep Speed



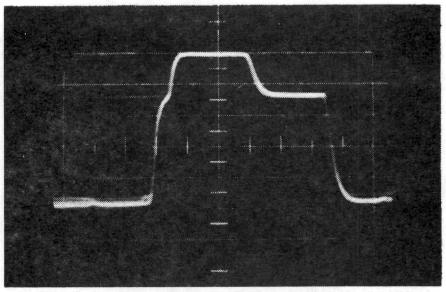
17. Plate of 2nd Video Ampl V304;
23 Volts Peak to Peak;
at 60-Cycle Horizontal Sweep Speed



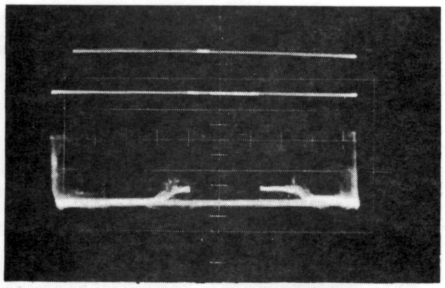
21. Cathode of Sync Cath. Follower
V326A (J313); 3 Volts Peak to Peak;
at 60-Cycle Horizontal Sweep Speed



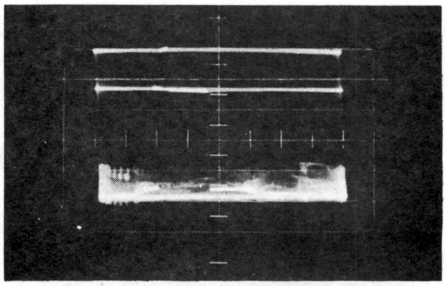
18. Modulator Output at J304;
300 Volts Peak to Peak;
at Line Rate Horizontal Sweep Speed



22. Plate of Sync Ampl V326B (J314);
14 Volts Peak to Peak;
at Line Rate Horizontal Sweep Speed



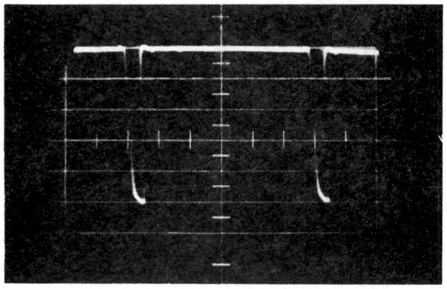
19. Modulator Output at J304;
300 Volts Peak to Peak;
at 60-Cycle Horizontal Sweep Speed



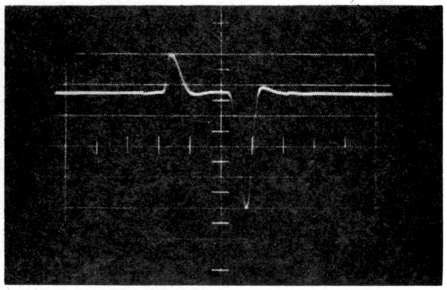
23. Plate of Sync Ampl V326B (J314);
14 Volts Peak to Peak;
at 60-Cycle Horizontal Sweep Speed

8027012-16C

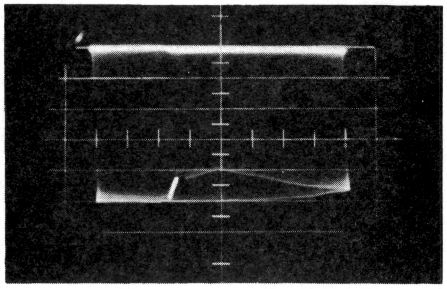
Figure 16—Oscillograms, Waveforms of Visual Modulator MI-34471-A (Sheet 3 of 6)



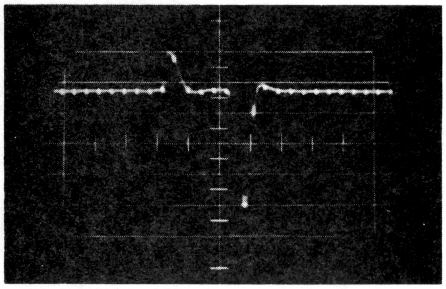
24. Plate of Sync Separator V327A (J315); 3.2 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed



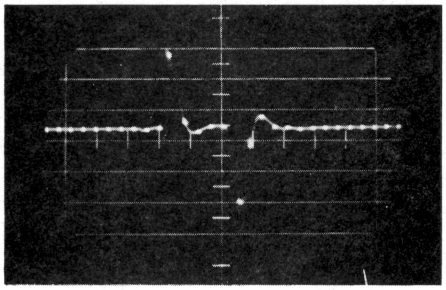
28. Grid of Clipper V328B (J316); 14 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed



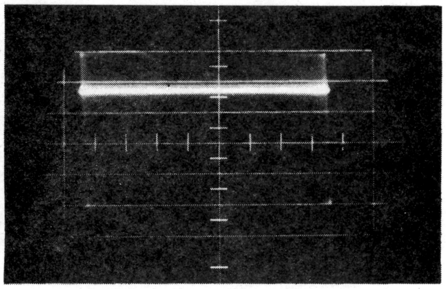
25. Plate of Sync Separator V327A (J315); 3.2 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



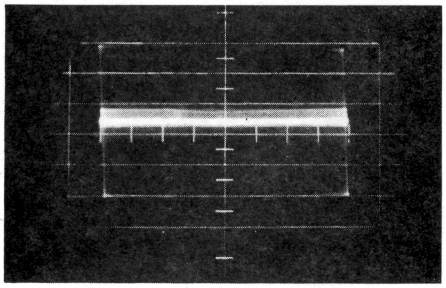
29. Grid of Clipper V328B (J316); 14 Volts Peak to Peak; 1-Microsecond Markers; at Line Rate Horizontal Sweep Speed



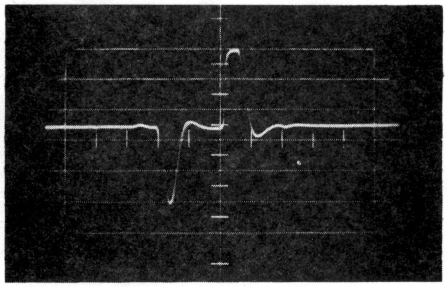
26. Plate of Pulse Former V328A (Pin 6); 21 Volts Peak to Peak; 1-Microsecond Markers; at Line Rate Horizontal Sweep Speed



30. Grid of Clipper V328B (J316); 14 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



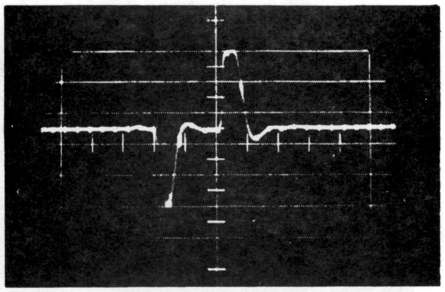
27. Plate of Pulse Former V328A (Pin 6); 21 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



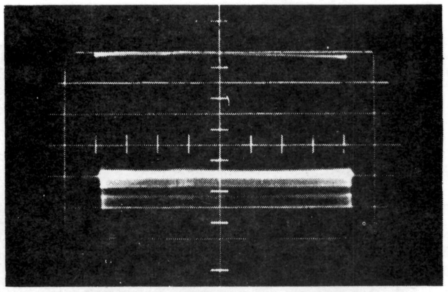
31. Plate of Clipper V328B (J317); 56 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed

8027012-16D

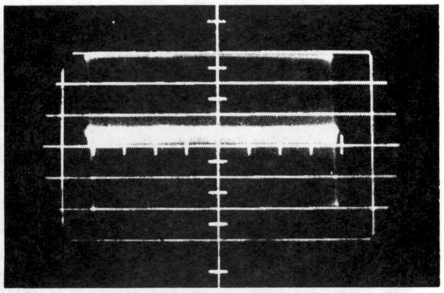
Figure 16—Oscillograms, Waveforms of Visual Modulator MI-34471-A (Sheet 4 of 6)



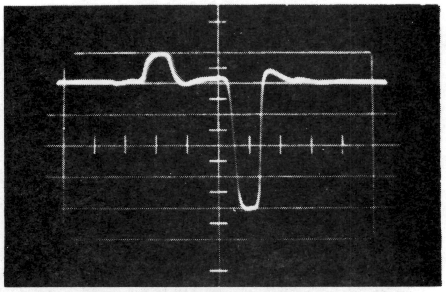
32. Plate of Clipper V328B (J317); 56 Volts Peak to Peak; 1-Microsecond Markers; at Line Rate Horizontal Sweep Speed



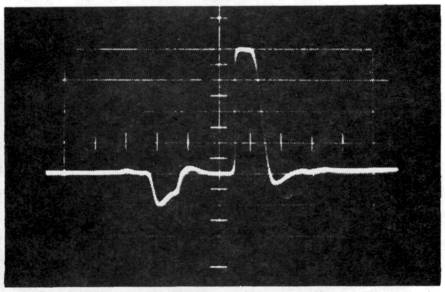
36. Cathode of Phase Splitter No. 1 (J319); 6.6 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



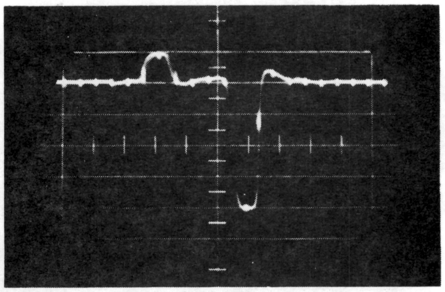
33. Plate of Clipper V328B (J317); 56 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



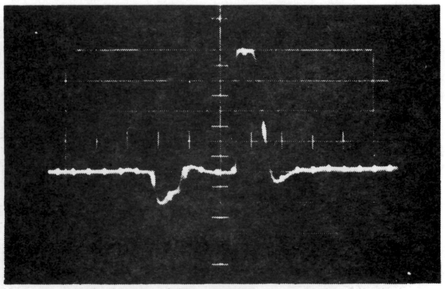
37. Plate of Phase Splitter No. 1 (J318); 6.6 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed



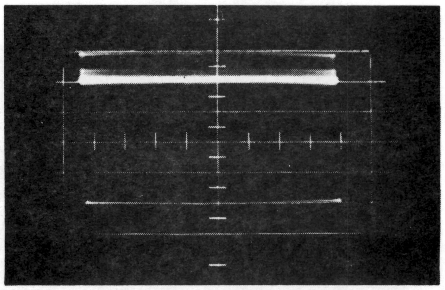
34. Cathode of Phase Splitter No. 1 (J319); 6.6 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed



38. Plate of Phase Splitter No. 1 (J318); 6.6 Volts Peak to Peak; 1-Microsecond Markers; at Line Rate Horizontal Sweep Speed



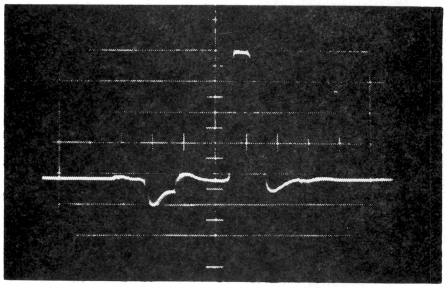
35. Cathode of Phase Splitter No. 1 (J319); 6.6 Volts Peak to Peak; 1-Microsecond Markers; at Line Rate Horizontal Sweep Speed



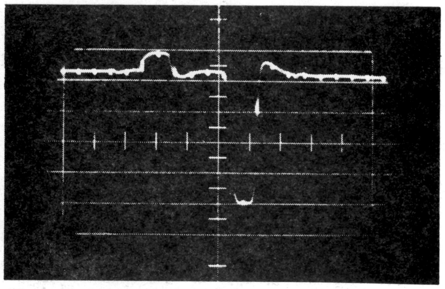
39. Plate of Phase Splitter No. 1 (J318); 6.6 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed

8027012-16E

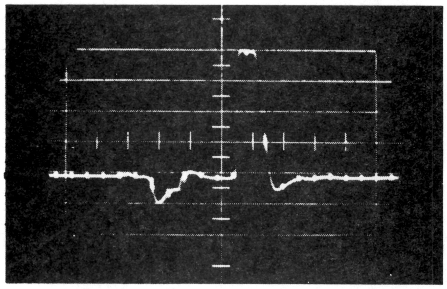
Figure 16—Oscillograms, Waveforms of Visual Modulator MI-34471-A (Sheet 5 of 6)



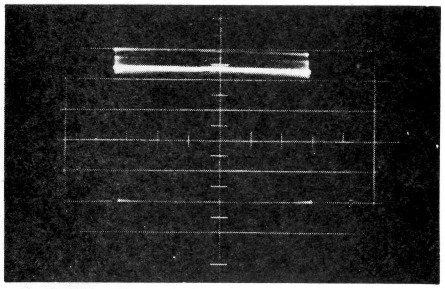
40. Cathode of Phase Splitter No. 2 (J321); 38 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed



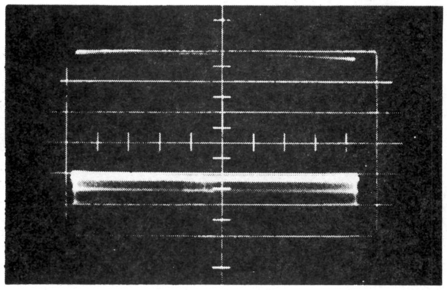
44. Plate of Phase Splitter No. 2 (J320); 38 Volts Peak to Peak; 1-Microsecond Markers; at Line Rate Horizontal Sweep Speed



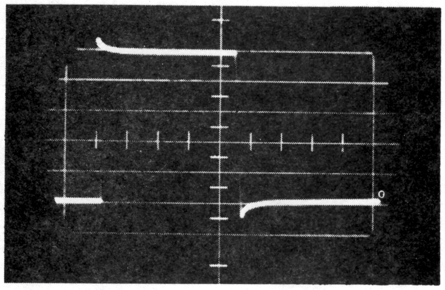
41. Cathode of Phase Splitter No. 2 (J321); 38 Volts Peak to Peak; 1-Microsecond Markers; at Line Rate Horizontal Sweep Speed



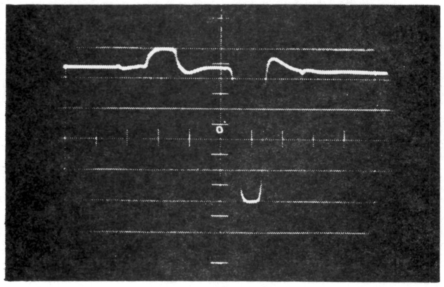
45. Plate of Phase Splitter No. 2 (J320); 38 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



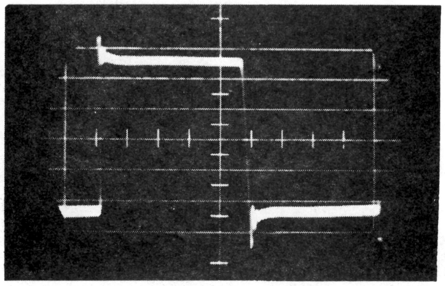
42. Cathode of Phase Splitter No. 2 (J321); 38 Volts Peak to Peak; at 60-Cycle Horizontal Sweep Speed



46. Modulator Input at J303; 100-KC Square Wave



43. Plate of Phase Splitter No. 2 (J320); 38 Volts Peak to Peak; at Line Rate Horizontal Sweep Speed



47. Modulator Ouput at J304; AC-DC-Emerg. Switch S304 Set to AC; 100-KC Square Wave; 180 Volts Peak to Peak

8027012-16F

Figure 16—Oscillograms, Waveforms of Visual Modulator MI-34471-A (Sheet 6 of 6)

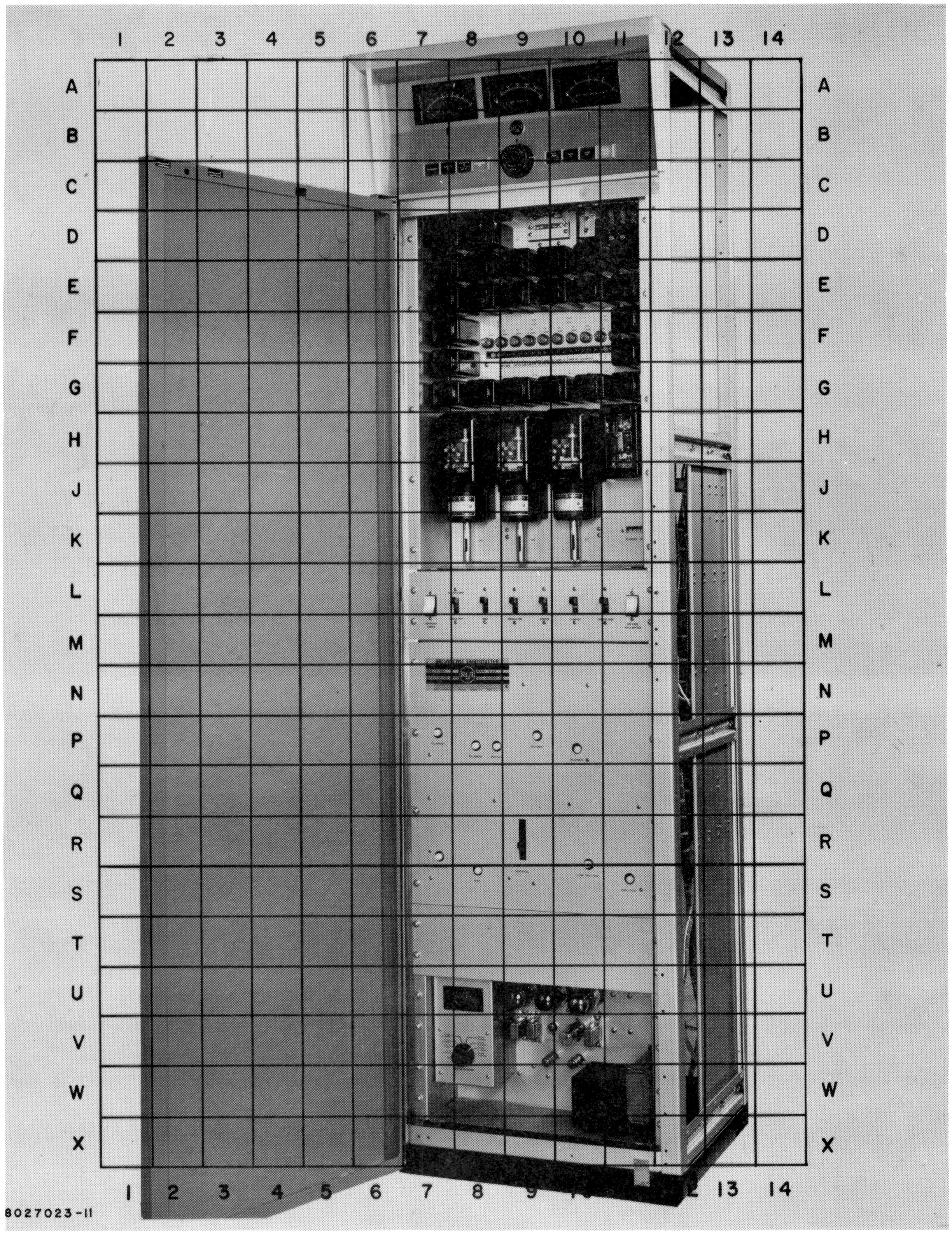

1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
T
U
V
W
X
8027023-11

Figure 17—Control Unit - Front View (Sheet 1 of 2)

COMPONENT LOCATION TABLE

By Coordinates

A7-1M1
A9-1M2
A10-1M3
B10-1I5
B10-1S15
B10-1I6
B10-1S16
B10-1I7
B10-1S17
B11-1I8
B11-1S18
C7-1I1
C7-1I2
C8-1I3
C8-1S13
C8-1I4
C8-1S14
C9-1S10
D7-1K43
D8-1K44
D9-1K9
D10-1K7
D10-1K40
D10-1K41
D11-1K42
E7-1K37
E7-1K31
E8-1K38
E8-1K32
E9-1K39
E9-1K33
E9-1K34
E10-1K35
E11-1K36
F7-1K21
F8-1F1
F8-1F2
F9-1F3
F9-1F4
F9-1F5
F10-1F6
F10-1F7
F10-1F8
F10-1F9
F11-1F10
F11-1K22
F11-1K20
G7-1K19
G7-1K13
G8-1K14
G9-1K15
G9-1K16
G10-1K17
G11-1K18
H8-1K10
H9-1K12
H10-1K11
H11-1K8
K11-1M4
L7-1S9
L8-1S7
L8-1S5
L9-1S6
L9-1S4
L10-1S2
L11-1S3
L11-1S8
R9-1S1

By Symbols

Meters
1M1-A7
1M2-A9
1M3-A10
1M4-K11

Indicators
1I1-C7
1I2-C7
1I3-C8
1I4-C8
1I5-B10
1I6-B10
1I7-B10
1I8-B11

Switches
1S1-R9
1S2-L10
1S3-L11
1S4-L9
1S5-L8
1S6-L9
1S7-L8
1S8-L11
1S9-L7
1S10-C9
1S13-C8
1S14-C8
1S15-B10
1S16-B10
1S17-B10
1S18-B11

Fuses

1F1-F8
1F2-F8
1F3-F9
1F4-F9
1F5-F9
1F6-F10
1F7-F10
1F8-F10
1F9-F10
1F10-F11

Relays
1K7-D10
1K8-H11
1K9-D9
1K10-H8
1K11-H10
1K12-H9
1K13-G7
1K14-G8
1K15-G9
1K16-G9
1K17-G10
1K18-G11
1K19-G7
1K20-F11
1K21-F7
1K22-F11
1K31-E7
1K32-E8
1K33-E9
1K34-E9
1K35-E10
1K36-E11
1K37-E7
1K38-E8
1K39-E9
1K40-D10
1K41-D10
1K42-D11
1K43-D7
1K44-D8

Figure 17—Control Unit - Front View (Sheet 2 of 2)

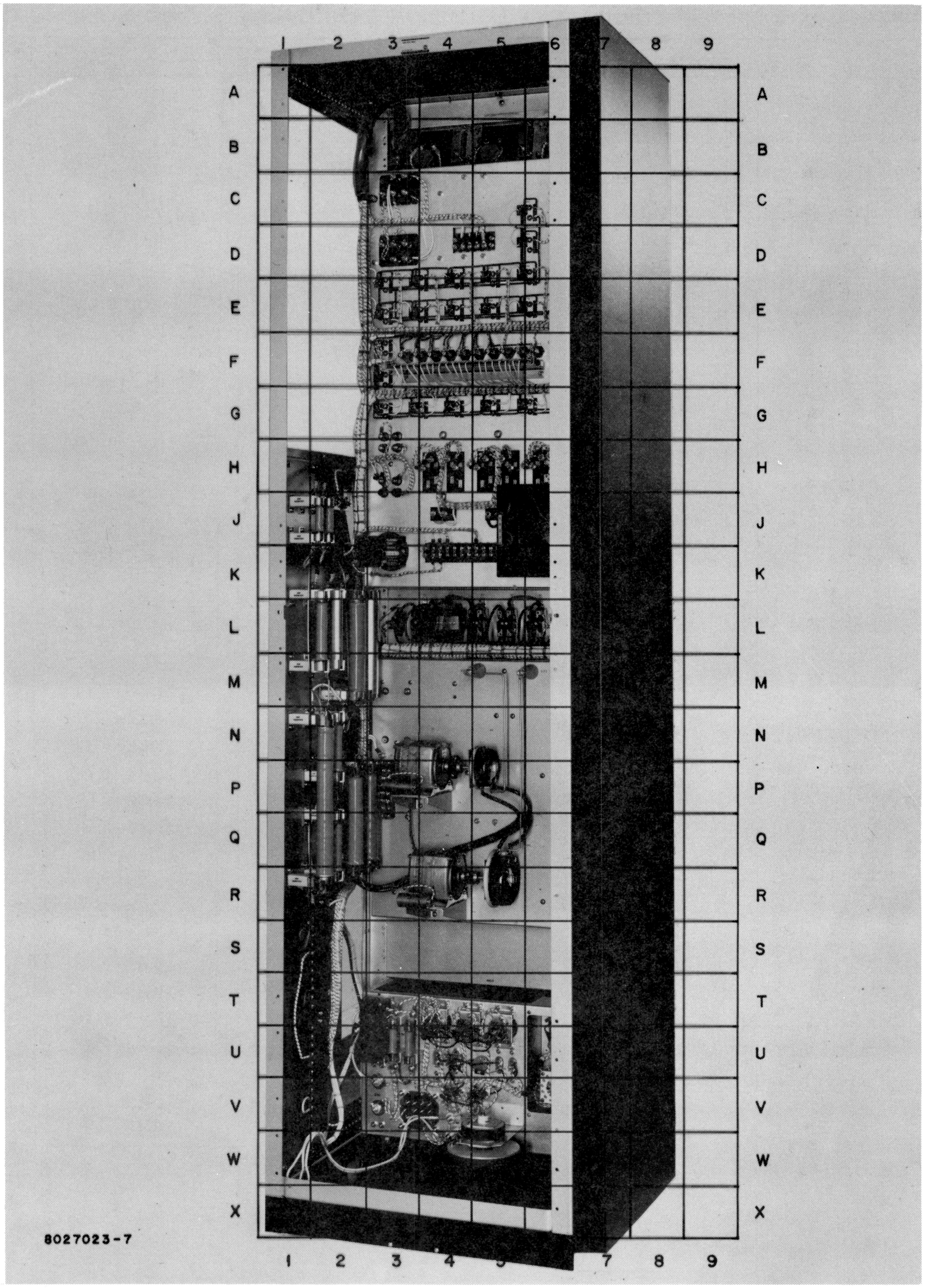

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
T
U
V
W
X
8027023-7

Figure 18—Control Unit - Right Oblique Rear View (Sheet 1 of 2)

COMPONENT LOCATION TABLE

By Coordinates

B3-1M3
B3-1C3
B5-1M2
B5-1C2
B6-1M1
B6-1C1
C3-1K7
C5-1K46
D4-1K9
D4-1K40
D5-1K39
D6-1K44
D6-1K38
E3-1K36
E3-1K35
E4-1K34
E5-1K33
E6-1K32
F2-1K22
F2-1K20
F3-1F10
F3-1F9
F4-1F8
F4-1F7
F4-1F6
F5-1F5
F5-1F4
F5-1F3
F5-1F2
F6-1F1
G3-1K18
G3-1K8
G5-1K14
G5-1K15
H4-1K11
H5-1K12
H6-1K10
J2-1R13
J2-1R10
J2-1R11
J2-1R8
J5-1T1
K3-1M4
K4-1E37-1E48
L2-1R4
L2-1R6
L3-1S8
L3-1S3
L4-1S2
L4-1S4
L5-1S6
L5-1S5
L6-1S7
N2-1E77
N2-1R1
N2-1R7
N3-1B1
N5-1R3
P2-1R12
P3-1R9
P3-1C1
Q2-1R2
Q4-1B2
Q5-1R5
R1-1E78
R1-1E1
R3-1C2
S2-1E2-1E7
T2-1E8-1E13
U2-1E14-1E19
V2-1E20-1E24

By Symbol

Meters
1M1-B6
1M2-B5
1M3-B3
1M4-K3

Capacitors
1C1-B6
1C1-P3
1C2-B5
1C2-R3
1C3-B3

Fuses
1F1-F6
1F2-F5
1F3-F5
1F4-F5
1F5-F5
1F6-F4
1F7-F4
1F8-F4
1F9-F3
1F10-F3

Transformer
1T1-J5

Motors
1B1-N3
1B2-Q4

Switches
1S2-L4
1S3-L3
1S4-L4
1S5-L5
1S6-L5
1S7-L6
1S8-L3

Terminals
1E1-R1
1E2-1E7-S2
1E8-1E13-T2
1E14-1E19-U2
1E20-1E24-V2
1E37-1E48-K4
1E77-N2
1E78-R1

Resistors
1R1-N2
1R2-Q4
1R3-N5
1R4-L2
1R5-Q5
1R6-L2
1R7-N2
1R8-J2
1R9-P3
1R10-J2
1R11-J2
1R12-P2
1R13-J2

Relays
1K7-C3
1K8-G3
1K9-D4
1K10-H6
1K11-H4
1K12-H5
1K14-G5
1K15-G5
1K18-G3
1K20-F2
1K22-F2
1K32-E6
1K33-E5
1K34-E4
1K35-E3
1K36-E3
1K38-D6
1K39-D5
1K40-D4
1K44-D6
1K46-C5

Figure 18—Control Unit - Right Oblique Rear View (Sheet 2 of 2)

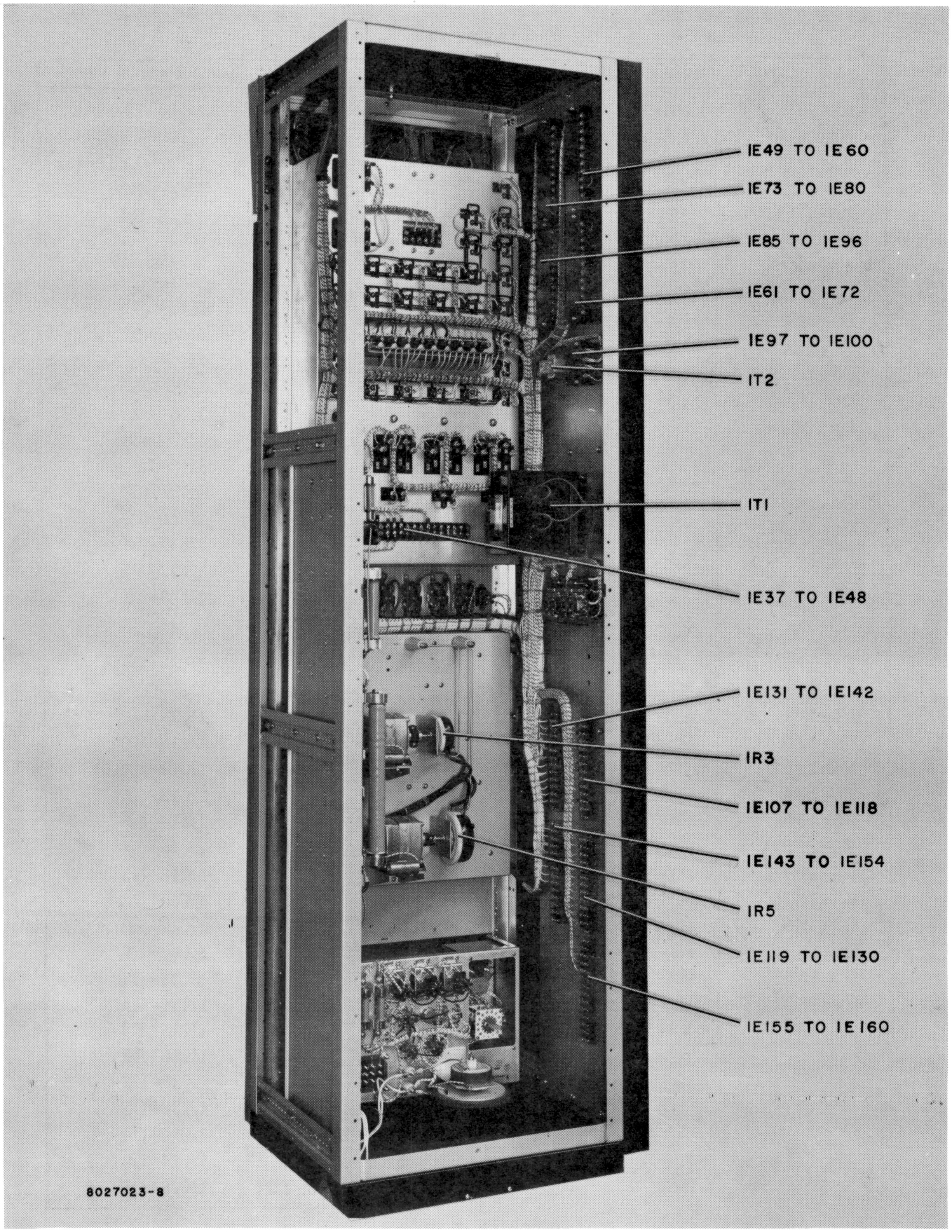
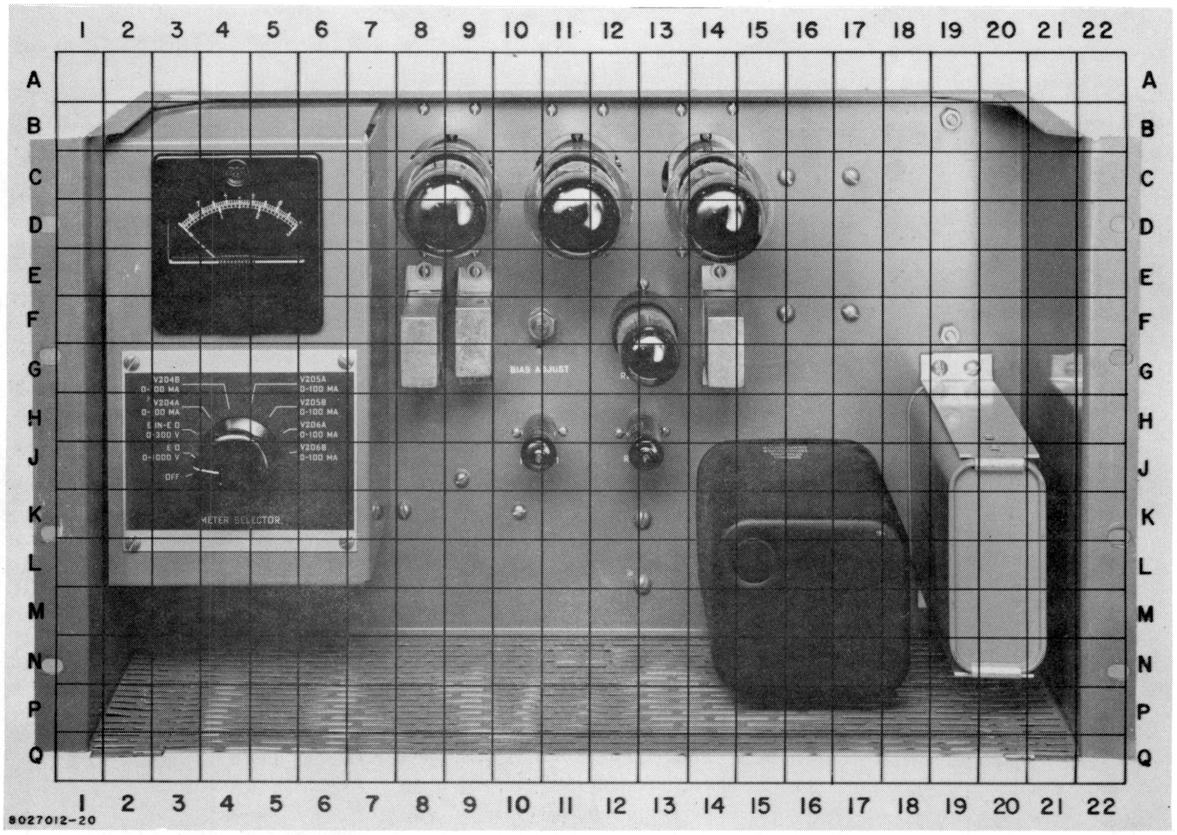

IE49 TO IE60
IE73 TO IE80
IE85 TO IE96
IE61 TO IE72
IE97 TO IE100
IT2
IT1
IE37 TO IE48
IE131 TO IE142
IR3
IE107 TO IE118
IE143 TO IE154
IR5
IE119 TO IE130
IE155 TO IE160
8027023-8

Figure 19—Control Unit - Left Oblique Rear View


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
A B C D E F G H J K L M N P Q
V204B
0- 00 MA
V204A
0- 00 MA
E IN-E O
0-300 V
E O
0-1000 V
OFF
V205A
0-100 MA
V205B
0-100 MA
V206A
0-100 MA
V206B
0-100 MA
METER SELECTOR
BIAS ADJUST
8027012-20

COMPONENT LOCATION TABLES

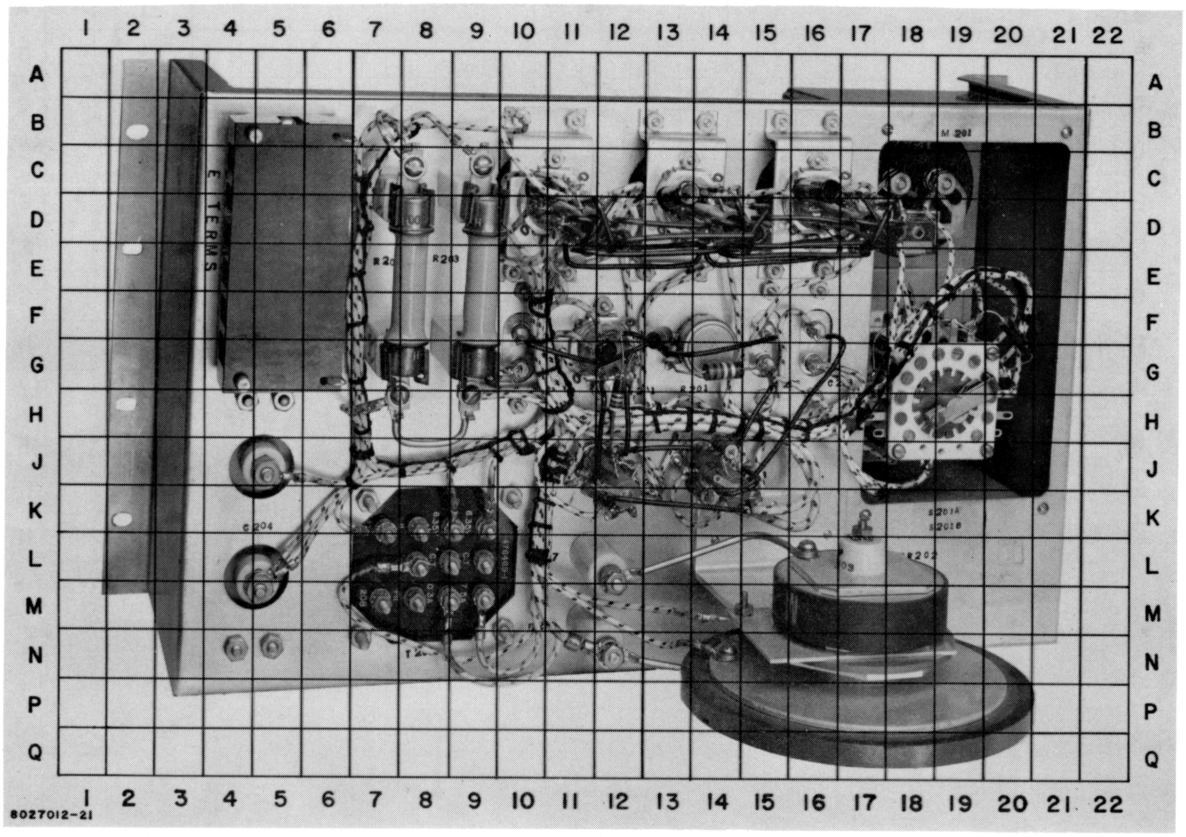
By Coordinates

C8 - 1V204	F14-1C202
C11-1V205	H10-1V203
C14-1V206	H13-1V202
D4 - 1M201	J4 - 1S201
F8 - 1C203	L16-1T201
F9 - 1C205	L20-1C204
F13-1V201	

By Symbol Number

Cap.	1V203-H10
1C202-F14	1V204-C8
1C203-F8	1V205-C11
1C204-L20	1V206-C14
1C205-F9	**Misc.**
Tubes	1M201-D4
1V201-F13	1S201-J4
1V202-H13	1T201-L16

Figure 20—Low Voltage Regulator, Front View


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
A B C D E F G H J K L M N P Q
E TERMS
R201
R203
M 201
C204
R201A
R201B
R202
8027012-21

COMPONENT LOCATION TABLES

By Coordinates

C5 - 1E201 to 1E206
C10-1XV206
C13-1XV205
C16-1XV204
C18-1M201
E8 -1R204
E9 -1R203
F14-1R201
F15-1C205
F16-1C203
F20-1R232
G10-1C202
G12-1XV201
H19-1S201
J12-1XV202
J14-1XV203
L5 -1C204
L8 -1T201
L12-1E207
M17-1CR202
N12-1E208
P17-1CR201

By Symbol Number

Term.
1E201 to 1E206 -C5
1E207 -L12
1E208 -N12
Sockets
1XV201 -G12
1XV202 -J12
1XV203 -J14
1XV204 -C16
1XV205-C13
1XV206-C10
Resistors
1R201 -F14
1R203 -E9
1R204 -E8
1R232 -F20
Capacitors
1C202 -G10
1C203 -F16
1C204 -L5
1C205 -F15
Misc.
1M201 -C18
1S201 -H19
1T201 -L8
1CR201-P17
1CR202-M17

Figure 21—Low Voltage Regulator, Rear View

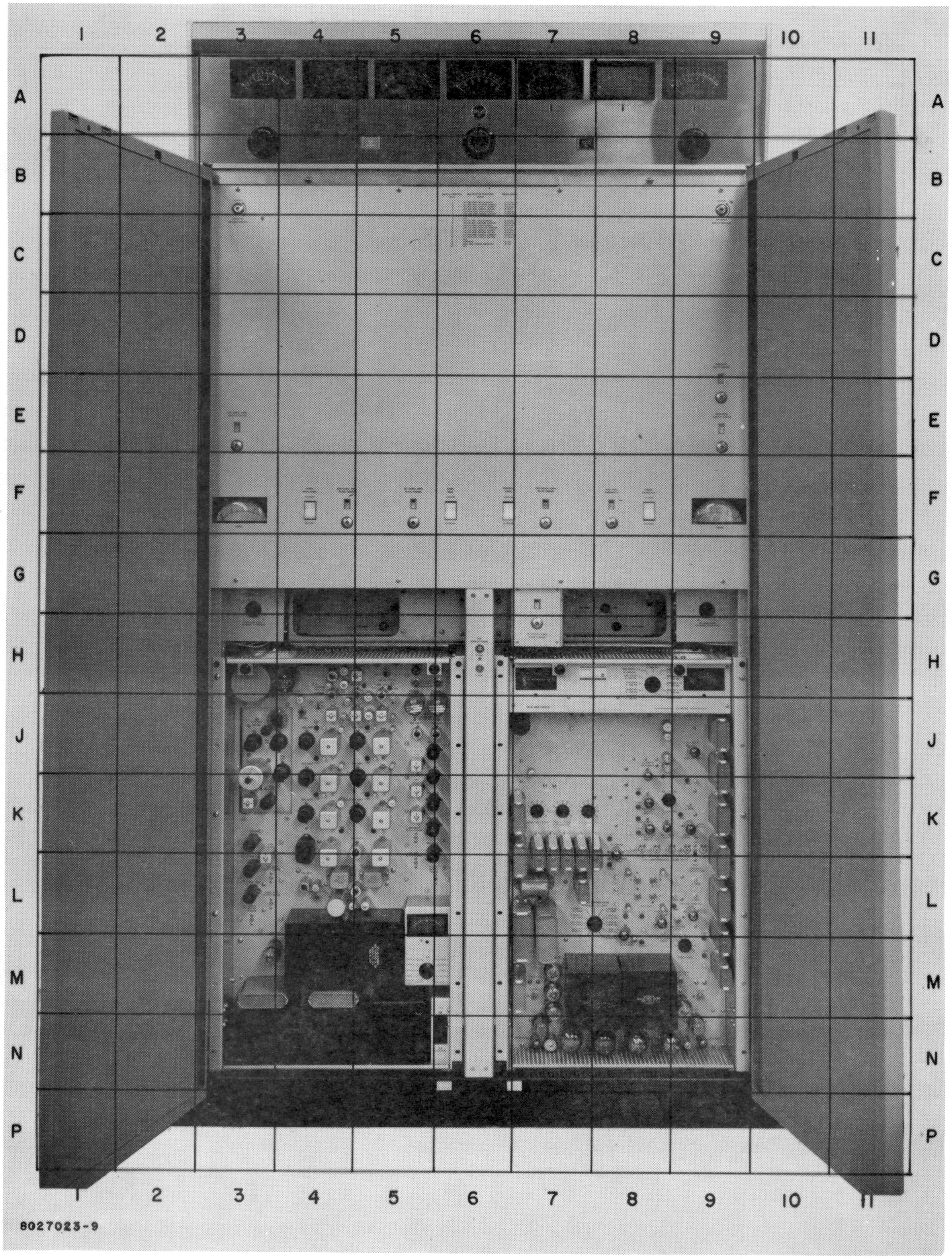

1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
J
K
L
M
N
P
8027023-9

Figure 22—6 kW Unit, Front View (Sheet 1 of 2)

COMPONENT LOCATION TABLE

By Coordinates

A3-M1
A4-M2
A5-M3
A6-M4
A7-M5
A8-M6
A9-M7
B3-S1
B3-
B5-XI1
B6-S2
B7-XI2
B9-S3
B9-
E3-L610
E9-L663
E9-C691
F4-S4
F4-C626
F5-L605
F6-S5
F6-S6
F7-L658
F8-C690
F8-S7
G3-R20
G4-R601
G5-C612
G7-C680
G8-C684
G8-R651
G9-R40
H5-C611
H7-L653
H8-C666

By Symbol

Capacitors
C611-H5
C612-G5
C626-F4
C666-H8
C680-G7
C684-G8
C900-F8
C691-E9

Inductors
L605-F5
L610-E3
L653-H7
L658-F7
L663-E9

Meters
M1-A3
M2-A4
M3-A5
M4-A6
M5-A7
M6-A8
M7-A9

Resistors
R20-G3
R40-G9
R601-G4
R651-G8

Switches
S1-B3
S2-B6
S3-B9
S4-F4
S5-F6
S6-F6
S7-F8

Indicators
XI1-B5
XI2-B7

Figure 22—6 kW Unit, Front View (Sheet 2 of 2)

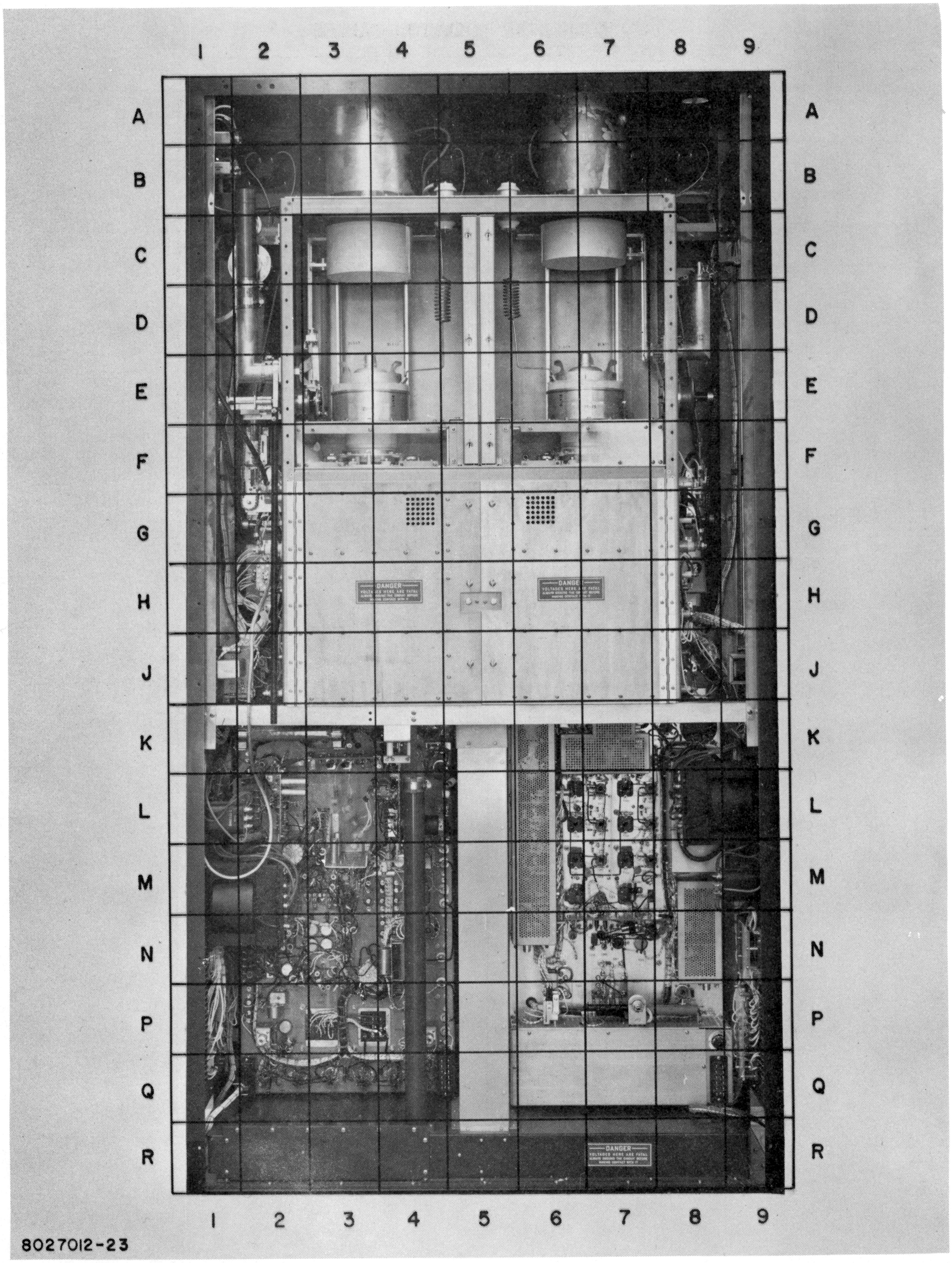

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
DANGER
VOLTAGES HERE ARE FATAL
8027012-23

Figure 23—6 kW Unit, Rear View (Sheet 1 of 2)

COMPONENT LOCATION TABLES

By Coordinates	
A9-XS10	J9-T8
A9-XS11	L1-R6
B1-R50	L1-R12
B1-T3	L1-R13
B2-M8	L1-R14
B2-C8	L1-R21
B3-M7	L1-T4
B3-C7	L8-T2
B4-M6	M1-T5
B4-C6	M9-R29
B5-M5	M9-R30
B5-C5	M9-T1
B5-M4	N9-R31
B5-C4	N9-R36
B6-M3	N9-R42
B6-C3	N9-R43
B7-M2	N9-R46
B7-C2	P1-R2
B8-M1	P1-R3
B8-C1	P1-R4
B9-T6	P1-R5
B9-T7	P1-R7
C8-S12	P1-R8
C8-R47	P1-R9
C8-R48	P1-R10
D1-Z1	P1-R11
G2-R653	P1-R15
G2-R654	P1-R22
H2-S3	P1-R23
H8-S1	P9-R32
J1-K1	P9-R33
J1-C9	P9-R34
J1-C10	P9-R35
J1-R17	P9-R37
J1-R18	P9-R38
J1-R25	P9-R39
J1-T9	P9-R44
J2-R20	P9-R45
J2-R652	Q1-R19
J2-XV1	Q1-R24
J9-CR1	Q1-R26
J9-R16	Q9-R49

By Symbol	
C1 -B8	R24 -Q1
C2 -B7	R25 -J1
C3 -B6	R26 -Q1
C4 -B5	R29 -M9
C5 -B5	R30 -M9
C6 -B4	R31 -N9
C7 -B3	R32 -P9
C8 -B2	R33 -P9
C9 -J1	R34 -P9
C10 -J1	R35 -P9
CR1 -J9	R36 -N9
K1 -J1	R37 -P9
M1 -B8	R38 -P9
M2 -B7	R39 -P9
M3 -B6	R42 -N9
M4 -B5	R43 -N9
M5 -B5	R44 -P9
M6 -B4	R45 -P9
M7 -B3	R46 -N9
M8 -B2	R47 -C8
R2 -P1	R48 -C8
R3 -P1	R49 -Q9
R4 -P1	R50 -B1
R5 -P1	R652-J2
R6 -L1	R653-G2
R7 -P1	R654-G2
R8 -P1	S1 -H8
R9 -P1	S3 -H2
R10 -P1	S12 -C8
R11 -P1	T1 -M9
R12 -L1	T2 -L8
R13 -L1	T3 -B1
R14 -L1	T4 -L1
R15 -P1	T5 -M1
R16 -J9	T6 -B9
R17 -J1	T7 -B9
R18 -J1	T8 -J9
R19 -Q1	T9 -J1
R20 -J2	XS10-A9
R21 -L1	XS11-A9
R22 -P1	XV1 -J2
R23 -P1	Z1 -D1

Figure 23—6 kW Unit, Rear View (Sheet 2 of 2)

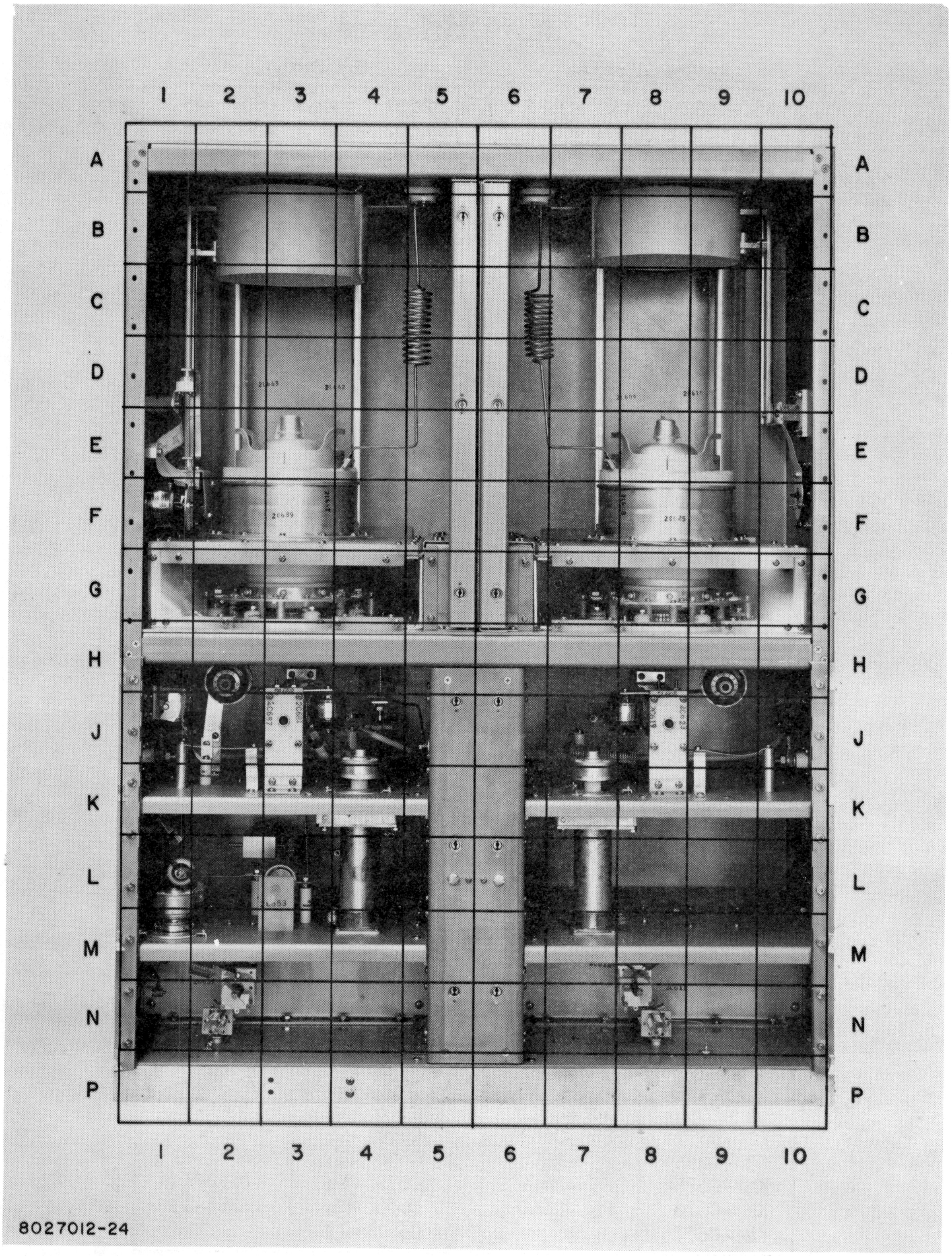

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
J
K
L
M
N
P
8027012-24

Figure 24—6 kW Unit, R-F Box (Sheet 1 of 2)

COMPONENT LOCATION TABLES

By Coordinates

A5 -C692
A6 -C627
B2 -L663
B9 -L610
C4 -L662
C5 -L661
C6 -L608
C7 -L609
F1 -C690
F1 -C691
F3 -C689
F8 -C625
F10-C626
G1 -C688
G3 -XV653
G8 -XV602
G10-C621
H1 -C663
H1 -C665
H1 -J652
H2 -C687
H4 -C680
H4 -L659
H9 -C623
H10-C608
H10-C610
J1 -C662
J1 -C664
J1 -C684
J2 -L665
J3 -C681
J3 -L656
J3 -L658
J5 -C682
J7 -L603
J8 -C619
J8 -L605
J10-C606
J10-C607
J10-C609
J10-R603
K1 -C656
K1 -L654
K2 -R657
K3 -L655
K4 -C675
K4 -C676
K4 -C677
K4 -C678
K4 -C679
K4 -L657
K4 -L666
K4 -XV652
K7 -C614
K7 -C615
K7 -C616
K7 -C617
K7 -C618
K7 -L604
K7 -L611
K7 -XV601
L1 -C657
L1 -C658
L1 -C659
L1 -C660
L1 -C661
L1 -C673
L3 -L653
L10-C602
L10-C603
L10-C604
L10-C605
M1 -C651
M1 -C652
M1 -C653
M1 -C654
M1 -C655
M1 -L652
M1 -R656
M1 -XV651
M2 -L651
M7 -L601
M8 -L602
M9 -R602
M10-C601
N2 -C666
N2 -C667
N2 -J651
N8 -C611
N8 -C612
N8 -J601
P5 -C683
P5 -R658
P5 -R659
P5 -R660

By Symbol

C601 -M10
C602 -L10
C603 -L10
C604 -L10
C605 -L10
C606 -J10
C607 -J10
C608 -H10
C609 -J10
C610 -H10
C611 -N8
C612 -N8
C614 -K7
C615 -K7
C616 -K7
C617 -K7
C618 -K7
C619 -J8
C621 -G10
C623 -H9
C625 -F8
C626 -F10
C627 -A6
C651 -M1
C652 -M1
C653 -M1
C654 -M1
C655 -M1
C656 -K1
C657 -L1
C658 -L1
C659 -L1
C660 -L1
C661 -L1
C662 -J1
C663 -H1
C664 -J1
C665 -H1
C666 -N2
C667 -N2
C673 -L1
C675 -K4
C676 -K4
C677 -K4
C678 -K4
C679 -K4
C680 -H4
C681 -J3
C682 -J5
C683 -P5
C684 -J1
C687 -H2
C688 -G1
C689 -F3
C690 -F1
C691 -F1
C692 -A5
J601 -N8
J651 -N2
J652 -H1
L601 -M7
L602 -M8
L603 -J7
L604 -K7
L605 -J8
L608 -C6
L609 -C7
L610 -B9
L611 -K7
L651 -M2
L652 -M1
L653 -L3
L654 -K1
L655 -K3
L656 -J3
L657 -K4
L658 -J3
L659 -H4
L661 -C5
L662 -C4
L663 -B2
L665 -J2
L666 -K4
R602 -M9
R603 -J10
R656 -M1
R657 -K2
R658 -P5
R659 -P5
R660 -P5
XV601-K7
XV602-G8
XV651-M1
XV652-K4
XV653-G3

Figure 24—6 kW Unit, R-F Box (Sheet 2 of 2)

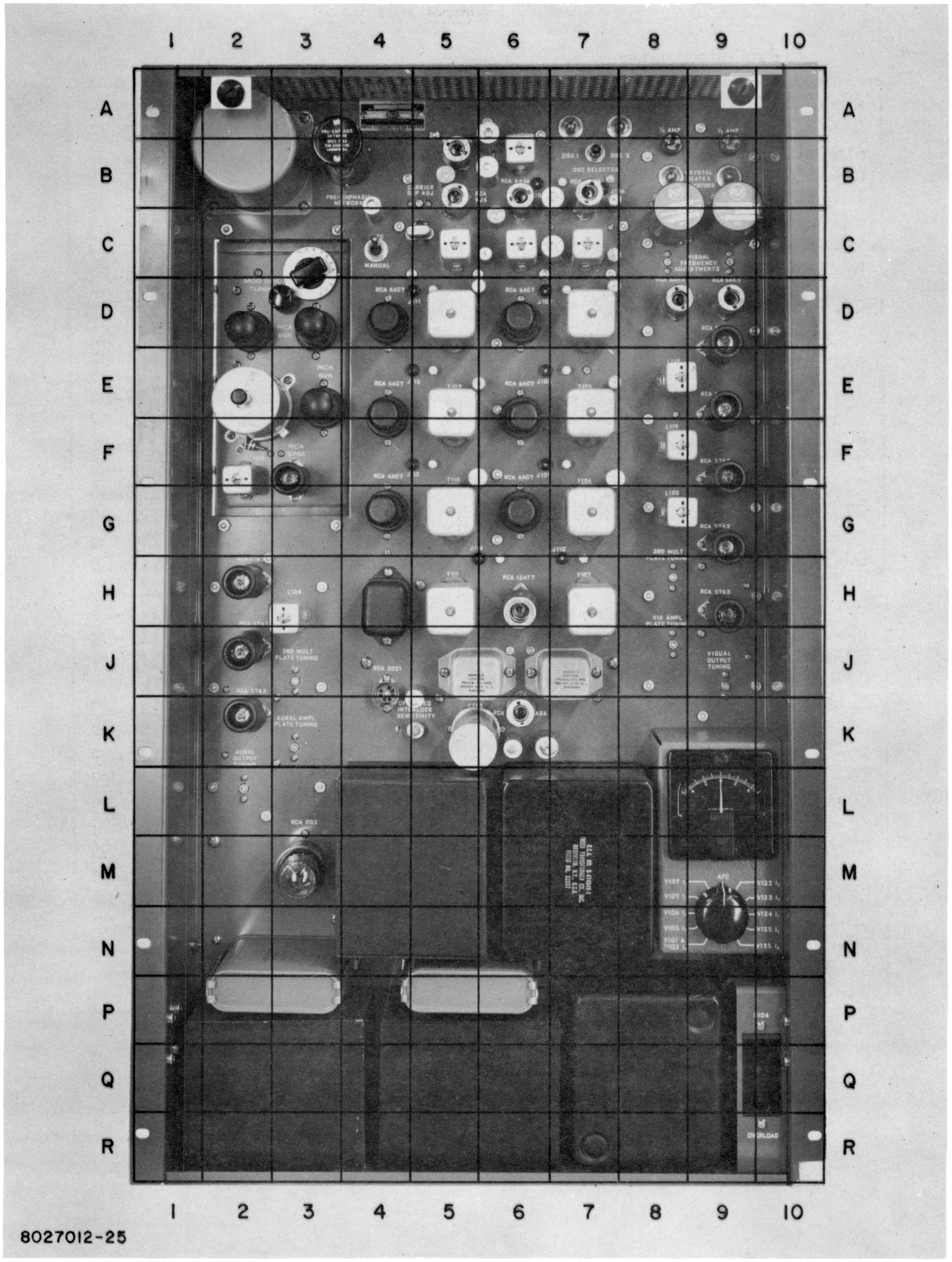

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
PRE-EMPHASIS NETWORK
MANUAL
OSC SELECTOR
VISUAL FREQUENCY ADJUSTMENTS
3RD MULT PLATE TUNING
AURAL AMPL PLATE TUNING
VISUAL OUTPUT TUNING
INTERLOCK SENSITIVITY
RCA 6AC7
RCA 12AT7
RCA 5763
RCA 2D21
RCA 0D3
AFC
OVERLOAD
8027012-25

Figure 25—Aural and Visual Exciter, Front View (Sheet 1 of 2)

COMPONENT LOCATION TABLES

By Coordinates

A2-T101
A3-Z101
A6-C151
A7-I103
A8-I104
B4-C215
B5-V108
B5-V114
B5-C149
B5-C272
B6-C150
B6-L109
B6-V109
B6-J105
B7-S103
B7-V110
B7-C156
B7-J106
B8-F101
B8-I101
B8-Y101
B9-F102
B9-I102
B9-Y102
C3-C103
C4-S102
C5-Y103
C5-L112
C6-C155
C6-L110
C6-C186
C7-C157
C7-L111
C7-C162
C8-C216
C9-C217
D2-V101
D3-V102
D4-V115
D5-J111
D5-T108
D5-C192
D6-V111
D6-J107
D7-T104
D7-C168
D8-V119
D9-V120
D9-V121
E2-T103
E3-V103
E4-V116
E5-J112
E5-T109
E5-C198
E6-V112
E6-J108
E7-T105
E7-C174
E8-L118
E9-V122
F2-L103
F3-V104
F5-J113
F5-C204
F6-J109
F7-C180
F8-L119
F9-V123
G4-V117
G5-T110
G6-V113
G7-T106
G8-L120
G9-V124
H2-V105
H3-L104
H4-L128
H5-T111
H6-J114
H6-V118
H7-J110
H7-T107
H8-C242
H9-V125
J2-V106
J3-C132
J4-V127
J5-T113
J7-T112
J8-C248
J9-C246
K2-V107
K3-C140
K5-C275
K5-R121
K5-C262
K6-V128
K6-C278
K6-C280
L2-C138
L4-L125
L6-T114
L9-M101
M3-V126
N9-S101
P2-C264
P5-C263
Q2-L127
Q5-L126
Q8-T115
Q9-S104

By Symbol

C103-C3
C132-J3
C138-L2
C140-K3
C149-B9
C150-B6
C151-A6
C155-C6
C156-B7
C157-C7
C162-C7
C168-D7
C174-E7
C180-F7
C186-C6
C192-D5
C198-E5
C204-F5
C215-B4
C216-C8
C217-C9
C242-H8
C246-J9
C248-J8
C262-K6
C263-P5
C264-P2
C272-B5
C275-K6
C278-K6
C280-K6
F101-B8
F102-B9
I101-B8
I102-B9
I103-A7
I104-A8
J105-B6
J106-B7
J107-D6
J108-E6
J109-F6
J110-H7
J111-D5
J112-E5
J113-F5
J114-H6
L103-F2
L104-H3
L109-B6
L110-C6
L111-C7
L112-C5
L118-E8
L119-F8
L120-G8
L125-L4
L126-Q5
L127-Q2
L128-H4
M101-L9
R121-K5
S101-N9
S102-C4
S103-B7
S104-Q9
T101-A2
T103-E2
T104-D7
T105-E7
T106-G7
T107-H7
T108-D5
T109-E5
T110-G5
T111-H5
T112-J7
T113-J5
T114-L6
T115-Q8
V101-D2
V102-D3
V103-E3
V104-F3
V105-H2
V106-J2
V107-K2
V108-B5
V109-B6
V110-B7
V111-D6
V112-E6
V113-G6
V114-B5
V115-D4
V116-E4
V117-G4
V118-H6
V119-D8
V120-D9
V121-D9
V122-E9
V123-F9
V124-G9
V125-H9
V126-M3
V127-J4
V128-K6
Y101-B8
Y102-B9
Y103-C5
Z101-A3

Figure 25—Aural and Visual Exciter, Front View (Sheet 2 of 2)

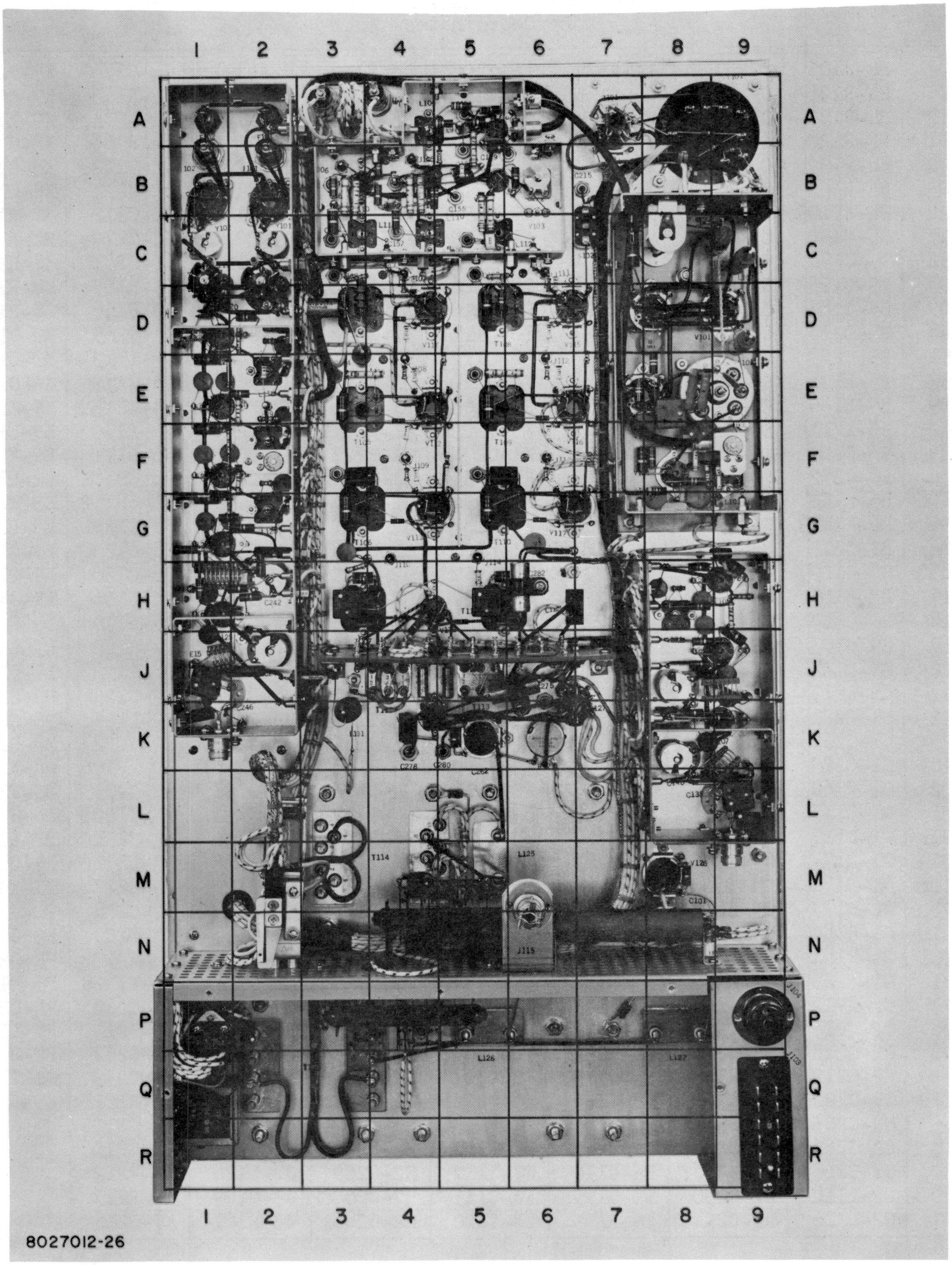

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
T114
L125
J115
L126
L127
C242
C246
E15
V126
C131
8027012-26

Figure 26—Aural and Visual Exciter, Rear View (Sheet 1 of 3)

COMPONENT LOCATION TABLE

By Coordinates

A1-F102
A2-C270
A2-C271
A2-F101
A3-I104
A3-S103
A4-C144
A4-C147
A4-C152
A4-I103
A4-L109
A5-C148
A5-C151
A5-C153
A5-R129
A5-R132
A5-R133
A5-R134
A5-XV108
A6-R130
A7-C284
A7-C285
A7-R217
A7-R218
A7-R219
A7-R220
A7-R221
A7-R222
A7-R223
A7-XZ101
A8-R102
A8-T101
B1-C291
B1-I102
B1-XY102
B2-C290
B2-I101
B2-XY101
B3-C161
B3-C163
B3-C298
B3-J106
B3-R141
B3-XV110
B4-C156
B4-C158
B4-C159
B4-C160
B4-C297
B4-J105
B4-R136
B4-R137
B4-R138
B4-R139
B4-R140
B4-XV109
B5-C150
B5-C154
B5-C155
B5-C187
B5-C273
B5-C299
B5-R131
B5-R135
B5-XV114
B6-C149
B6-C272
B6-R150
B6-XY103
B7-C215
B8-C102
B8-R101
B9-C113
B9-R103
B9-R104
C1-C217
C1-C221
C1-C222
C1-C223
C1-C269
C1-L115
C1-L117
C1-R177
C1-R178
C1-R179
C1-R180
C1-R181
C1-R225
C1-XV120
C2-C216
C2-C218
C2-C219
C2-C220
C2-C265
C2-C266
C2-C268
C2-L114
C2-L116
C2-R172
C2-R173
C2-R174
C2-R175
C2-R176
C2-R224
C2-XV119
C3-C146
C3-C162
C3-C168
C3-C169
C3-L111
C3-L129
C3-R208
C4-C145
C4-C157
C4-C164
C4-J107
C4-L110
C4-R207
C5-C186
C5-C192
C5-C193
C5-L112
C5-L113
C6-C185
C6-C188
C6-C189
C6-C190
C6-C191
C6-J111
C7-C107
C7-R107
C7-R108
C8-C103
C9-C104
C9-L102
C9-R105
C9-R106
C9-T102
D1-C224
D1-C225
D1-R182
D1-R183
D1-XV121
D2-C226
D2-C227
D2-C250
D2-C294
D2-R184
D3-C249
D3-L130
D3-R143
D3-T104
D4-C165
D4-C166
D4-C167
D4-C170
D4-R142
D4-XV111
D5-R151
D5-R153
D5-T108
D6-C194
D6-R152
D6-XV115
D8-C105
D8-C109
D8-XV102
D9-L101
D9-XV101
E1-C229
E1-C230
E1-C231
E1-XV122
E2-C228
E2-C232
E2-C233
E2-C252
E2-C253
E2-C295
E2-L118
E2-R185
E2-R186
E2-R188
E3-C174
E3-C175
E3-R145
E3-T105
E4-C171
E4-C172
E4-C173
E4-J108
E4-R144
E4-XV112
E5-C198
E5-C199
E5-R155
E5-T109
E6-C195
E6-C196
E6-J112
E6-R154
E6-XV116
E7-C197
E7-R109
E7-XV103
E8-C106
E8-C110
E8-C111
E8-C112
E8-R110
E9-C108
E9-T103
F1-C234
F1-C235
F1-C236
F1-R187
F1-R191
F1-XV123
F2-C237
F2-C238
F2-C254
F2-C296
F2-C1001
F2-L119
F2-R189
F2-R190
F2-R192
F3-C180
F3-C181
F3-C255
F4-C176
F4-C177
F4-C178
F4-J109
F5-C179
F5-C204
F5-C205
F6-C200
F6-C201
F6-C202
F6-J113
F7-C203
F7-R112
F8-C115
F8-C120
F8-C122
F8-R111
F8-R113
F8-R114
F8-XV104
F9-C114
F9-C119
F9-C292
F9-C1002
F9-L103
G1-C239
G1-C240
G1-C241
G1-R195
G1-R196
G1-R201
G1-R227
G1-XV124
G2-C256
G2-C257
G2-C258
G2-R193
G2-R194
G2-R226
G2-L120
G3-C182
G3-R147
G3-T106
G4-J110
G4-R146
G4-XV113
G5-J114
G5-R157
G5-T110
G6-C206
G6-R156
G6-XV117
G7-C117
G8-C116
G8-C118
G9-C121
H1-C243
H1-C245
H1-L121
H1-XV125
H2-C242
H2-C259
H2-C260
H2-C288
H2-L122
H2-R197
H2-R198
H2-R199
H2-R200
H3-C183
H3-C184
H3-C210
H3-R148
H3-R149
H3-T107
H4-R162
H4-R163
H4-R166
H4-XV118
H5-C207
H5-C208
H5-C274
H5-R158
H5-R159
H5-R206
H5-T111
H6-C282
H6-L128
H8-C123
H8-C124
H8-C125
H8-C126
H8-C128
H8-C130
H8-C131
H8-C293
H8-L104
H8-R115
H8-R116
H8-R118
H9-C127
H9-C267
H9-R117
H9-XV105
J1-C244
J1-C246
J1-C247
J1-L123
J2-C248
J2-C261
J2-L124
J3-C209
J3-R161
J4-C276
J4-R160
J4-R164
J4-R165
J4-T112
J5-C211
J5-C212
J5-C279
J5-C281
J5-R167
J5-R168
J5-R169
J5-T113
J6-C213
J6-C214
J6-R170
J6-R171
J6-CR101
J6-CR102
J8-C132
J8-C133
J8-C136
J8-L106
J8-R119
J8-R120
J8-R123
J9-C129
J9-L105
J9-R122
J9-XV106
K1-C289
K1-J102
K2-C251
K3-L131
K4-C277
K4-C278
K4-R209
K4-R210
K4-XV128
K5-C280
K5-R211
K5-C262
K6-C275
K6-R121
K7-CR105
K7-CR106
K7-R212
K7-R213
K7-R214
K7-R215
K7-R216
K7-XV127
K8-C140
K8-C141
K8-C142
K8-R124
K8-R125
K8-R126
K8-R127
K8-R128
K9-C134
K9-C135
K9-C137
K9-C286
K9-L107
K9-XV107
L2-K101
L3-T114
L5-L125
L9-C138
L9-C139
L9-C143
L9-C287
L9-L108
L9-L128
M3-CR103
M8-C101
M8-R203
M8-XV126
M9-J101
N6-J115
N7-R202
P1-C283
P1-K102
P2-T115
P3-CR104
P5-C263
P5-L126
P8-C264
P8-L127
P9-J104
Q1-T116
Q9-J103

Figure 26—Aural and Visual Exciter, Rear View (Sheet 2 of 3)

COMPONENT LOCATION TABLE

By Symbol

C101 -M8
C102 -B8
C103 -C8
C104 -C9
C105 -D8
C106 -E8
C107 -C7
C108 -E9
C109 -D8
C110 -E8
C111 -E8
C112 -E8
C113 -B9
C114 -F9
C115 -F8
C116 -G8
C117 -G7
C118 -G8
C119 -F9
C120 -F8
C121 -G9
C122 -F8
C123 -H8
C124 -H8
C125 -H8
C126 -H8
C127 -H9
C128 -H8
C129 -J9
C130 -H8
C131 -H8
C132 -H8
C133 -J8
C134 -K9
C135 -K9
C136 -J8
C137 -K9
C138 -L9
C139 -L9
C140 -K8
C141 -K8
C142 -K8
C143 -L9
C144 -A4
C145 -C4
C146 -C3
C147 -A4
C148 -A5
C149 -B6
C150 -B5
C151 -A5
C152 -A4
C153 -A5
C154 -B5
C155 -B5
C156 -B4
C157 -C4
C158 -B4
C159 -B4
C160 -B4
C161 -B3
C162 -C3
C163 -B3
C164 -C4
C165 -D4
C166 -D4
C167 -D4
C168 -C3
C169 -C3
C170 -D4
C171 -E4
C172 -E4
C173 -E4
C174 -E3
C175 -E3
C176 -F4
C177 -F4
C178 -F4
C179 -F5
C180 -F3
C181 -F3
C182 -G3
C183 -H3
C184 -H3
C185 -C6
C186 -C5
C187 -B5
C188 -C6
C189 -C6
C190 -C6
C191 -C6
C192 -C5
C193 -C5
C194 -D6
C195 -E6
C196 -E6
C197 -E7
C198 -E5
C199 -E5
C200 -F6
C201 -F6
C202 -F6
C203 -F7
C204 -F5
C205 -F5
C206 -G6
C207 -H5
C208 -H5
C209 -J3
C210 -H3
C211 -J5
C212 -J5
C213 -J6
C214 -J6
C215 -B7
C216 -C2
C217 -C1
C218 -C2
C219 -C2
C220 -C2
C221 -C1
C222 -C1
C223 -C1
C224 -D1
C225 -D1
C226 -D2
C227 -D2
C228 -E2
C229 -E1
C230 -E1
C231 -E1
C232 -E2
C233 -E2
C234 -F1
C235 -F1
C236 -F1
C237 -F2
C238 -F2
C239 -G1
C240 -G1
C241 -G1
C242 -H2
C243 -H1
C244 -J1
C245 -H1
C246 -J1
C247 -J1
C248 -J2
C249 -D3
C250 -D2
C251 -K2
C252 -E2
C253 -E2
C254 -F2
C255 -F3
C256 -G2
C257 -G2
C258 -G2
C259 -H2
C260 -H2
C261 -J2
C262 -K5
C263 -P5
C264 -P8
C265 -C2
C266 -C2
C267 -H9
C268 -C2
C269 -C1
C270 -A2
C271 -A2
C272 -B6
C273 -B5
C274 -H5
C275 -K6
C276 -J4
C277 -K4
C278 -K4
C279 -J5
C280 -K5
C281 -J5
C282 -H6
C283 -P1
C284 -A7
C285 -A7
C286 -K9
C287 -L9
C288 -H2
C289 -K1
C290 -B2
C291 -B1
C292 -F9
C293 -H8
C294 -D2
C295 -E2
C296 -F2
C297 -B4
C298 -B3
C299 -B5
C1001-F2
C1002-F9
CR101-J6
CR102-J6
CR103-M3
CR104-P3
CR105-K7
CR106-K7
F101 -A2
F102 -A1
I101 -B2
I102 -B1
I103 -A4
I104 -A3
J101 -M9
J102 -K1
J103 -Q9
J104 -P9
J105 -B4
J106 -B3
J107 -C4
J108 -E4
J109 -F4
J110 -G4
J111 -C6
J112 -E6
J113 -F6
J114 -G5
J115 -N6
K101 -L2
K102 -P1
L101 -D9
L102 -C9
L103 -F9
L104 -H8
L105 -J9
L106 -J8
L107 -K9
L108 -L9
L109 -A4
L110 -C4
L111 -C3
L112 -C5
L113 -C5
L114 -C2
L115 -C1
L116 -C2
L117 -C1
L118 -E2
L119 -F2
L120 -G2
L121 -H1
L122 -H2
L123 -J1
L124 -J2
L125 -L5
L126 -P5
L127 -P8
L128 -H6
L129 -C3
L130 -D3
L131 -K3
R101 -B8
R102 -A8
R103 -B9
R104 -B9
R105 -C9
R106 -C9
R107 -C7
R108 -C7
R109 -E7
R110 -E8
R111 -F8
R112 -F7
R113 -F8
R114 -F8
R115 -H8
R116 -H8
R117 -H9
R118 -H8
R119 -J8
R120 -J8
R121 -K6
R122 -J9
R123 -J8
R124 -K8
R125 -K8
R126 -K8
R127 -K8
R128 -K8
R129 -A5
R130 -A6
R131 -B5
R132 -A5
R133 -A5
R134 -A5
R135 -B5
R136 -B4
R137 -B4
R138 -B4
R139 -B4
R140 -B4
R141 -B3
R142 -D4
R143 -D3
R144 -E4
R145 -E3
R146 -G4
R147 -G3
R148 -H3
R149 -H3
R150 -B6
R151 -D5
R152 -D6
R153 -D5
R154 -E6
R155 -E5
R156 -G6
R157 -G5
R158 -H5
R159 -H5
R160 -J4
R161 -J3
R162 -H4
R163 -H4
R164 -J4
R165 -J5
R166 -H4
R167 -J5
R168 -J5
R169 -J5
R170 -J6
R171 -J6
R172 -C2
R173 -C2
R174 -C2
R175 -C2
R176 -C2
R177 -C1
R178 -C1
R179 -C1
R180 -C1
R181 -C1
R182 -D1
R183 -D1
R184 -D2
R185 -E2
R186 -E2
R187 -F1
R188 -E2
R189 -F2
R190 -F2
R191 -F1
R192 -F2
R193 -G2
R194 -G2
R195 -G1
R196 -G1
R197 -H2
R198 -H2
R199 -H2
R200 -H2
R201 -G1
R202 -N7
R203 -M8
R206 -H5
R207 -C4
R208 -C3
R209 -K4
R210 -K4
R211 -K5
R212 -K7
R213 -K7
R214 -K7
R215 -K7
R216 -K7
R217 -A7
R218 -A7
R219 -A7
R220 -A7
R221 -A7
R222 -A7
R223 -A7
R224 -C2
R225 -C1
R226 -G2
R227 -G1
S103 -A3
T101 -A8
T102 -C9
T103 -E9
T104 -D3
T105 -E3
T106 -G3
T107 -H3
T108 -D5
T109 -E5
T110 -G5
T111 -H5
T112 -J4
T113 -J5
T114 -L3
T115 -P2
T116 -Q1
XV101-D9
XV102-D8
XV103-E7
XV104-F8
XV105-H9
XV106-J9
XV107-K9
XV108-A5
XV109-B4
XV110-B3
XV111-D4
XV112-E4
XV113-G4
XV114-B5
XV115-D6
XV116-E6
XV117-G6
XV118-H4
XV119-C2
XV120-C1
XV121-D1
XV122-E1
XV123-F1
XV124-G1
XV125-H1
XV126-M8
XV127-K7
XV128-K4
XY101-B2
XY102-B1
XY103-B6
XZ101-A7

Figure 26—Aural and Visual Exciter, Rear View (Sheet 3 of 3)

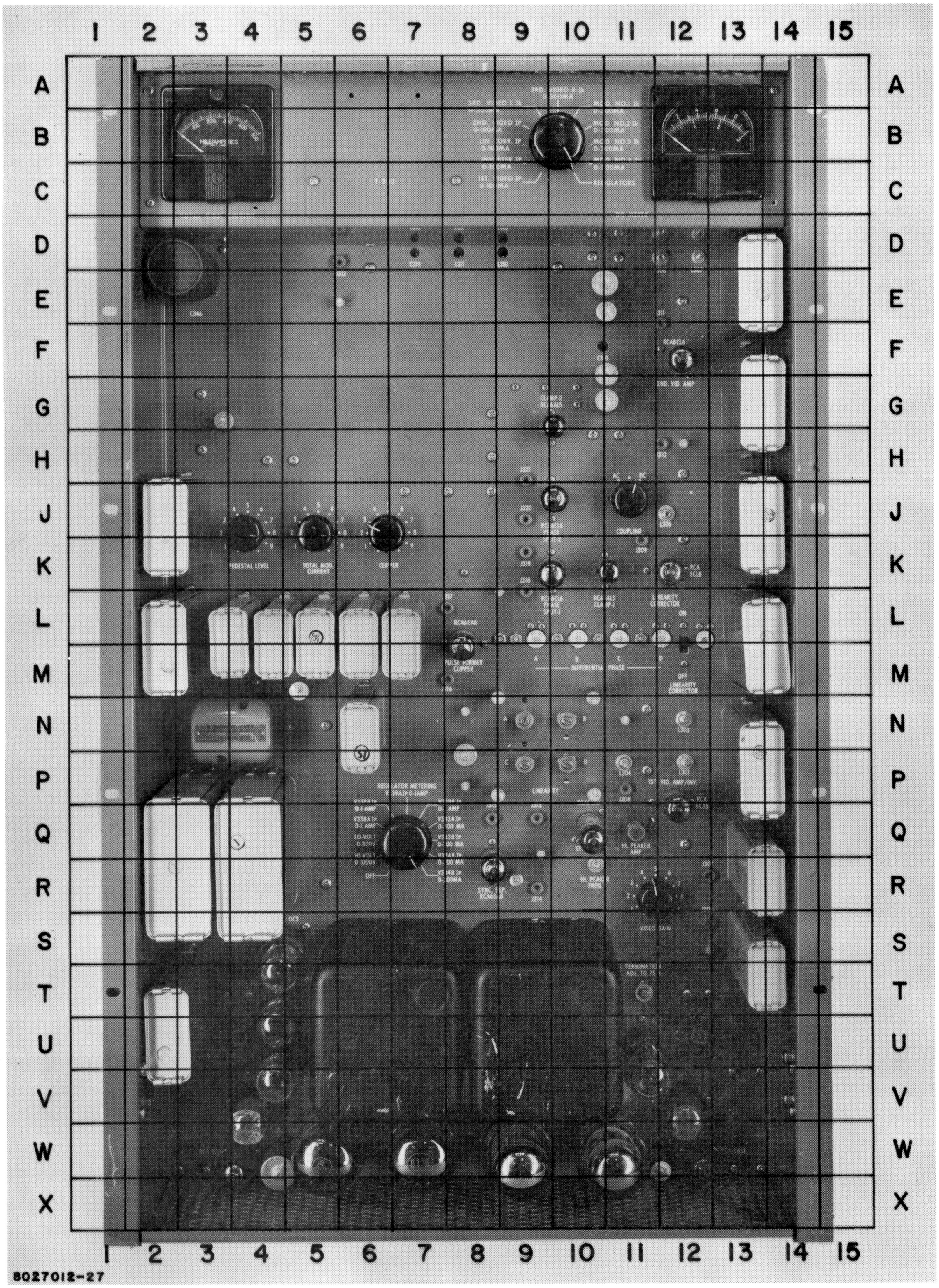

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H J K L M N P Q R S T U V W X
MILLIAMPERES
REGULATORS
2ND. VID. AMP
COUPLING
PEDESTAL LEVEL
TOTAL MOD. CURRENT
CLIPPER
PULSE FORMER CLIPPER
DIFFERENTIAL PHASE
LINEARITY CORRECTOR
ON
OFF
REGULATOR METERING
LINEARITY
HI. PEAKER AMP
HI. PEAKER FREQ.
VIDEO GAIN
8027012-27

Figure 27—Visual Modulator, Front View (Sheet 1 of 2)

COMPONENT LOCATION TABLES

By Coordinates

B3 -2M302
B9 -2S301
B12-2M301
D2 -2C346
D3 -2C321
D6 -2J312
D7 -2C319
D8 -2L311
D9 -2L310
D12-2L308
D12-2L307
E11-2C318
E11-2C316
E12-2J311
F11-2C310
F11-2C375
F12-2V304
G3 -2C342
G10-2V332
G11-2C379
G13-2C322
H9 -2J321
H12-2J310
J2 -2C338
J4 -2R488
J5 -2R492
J6 -2R455
J9 -2J320

J10-2V330
J11-2J309
J11-2S303
J12-2L306
J13-2C313
K9 -2J319
K9 -2J318
K10-2V329
K11-2V331
K12-2V302
L2 -2C339
L3 -2C382
L4 -2C365
L5 -2C363
L6 -2C360
L7 -2C355
L8 -2J317
L8 -2V328
L9 -2C390
L10-2C391
L11-2C392
L12-2C393
L12-2S304
L12-2C398
L12-2C309
M5 -2C348
M8 -2J316

M9 -2C394
M10-2C395
N3 -2K301
N6 -2C374
N8 -2C358
N9 -2R558
N10-2R559
N12-2L303
P9 -2C396
P9 -2R560
P10-2R561
P10-2C397
P11-2L304
P11-2J308
P12-2L301
P13-2C305
Q2 -2C388
Q4 -2C387
Q7 -2S302
Q8 -2J315
Q9 -2J313
Q10-2V326
Q11-2R310
Q12-2V301
R8 -2V327
R9 -2C359
R9 -2J314

R10-2L326
R11-2R301
R11-2R443
R12-2J307
R13-2C307
S12-2J306
T4 -2V342
T11-2R302
T13-2C303
U2 -2C383
U4 -2V343
U4 -2R542
U6 -2T302
U9 -2T301
U12-2R519
V4 -2V340
V4 -2V344
V11-2V336
V12-2V335
W4 -2V341
W4 -2C386
W5 -2V338
W7 -2V339
W9 -2V333
W11-2V334
W12-2C384
W12-2V337

By Symbol Number

Cap.
2C303-T13
2C305-P13
2C307-R13
2C309-L12
2C310-F10
2C313-J13
2C316-E11
2C318-E11
2C319-D7
2C321-D3
2C322-G13
2C338-J2
2C339-L2
2C342-G3
2C346-D2
2C348-M5
2C355-L7
2C358-N8
2C359-R9
2C360-L6
2C363-L5
2C365-L4
2C374-N6
2C375-F11
2C379-G11
2C382-L3
2C383-U2
2C384-W12

2C386-W4
2C387-Q4
2C388-Q2
2C390-L9
2C391-L10
2C392-L11
2C393-L12
2C394-M9
2C395-M10
2C396-P9
2C397-P10
2C398-L12

Jacks
2J306-S12
2J307-R12
2J308-P11
2J309-J11
2J310-H12
2J311-E12
2J312-D6
2J313-Q9
2J314-R9
2J315-Q8
2J316-M8
2J317-L8
2J318-K9
2J319-K9
2J320-J9
2J321-H9

Coils
2L301-P12
2L303-N12
2L304-P11
2L306-J12
2L307-D12
2L308-D12
2L310-D9
2L311-D8
2L326-R10

Res.
2R301-R11
2R302-T11
2R310-Q11
2R443-R11
2R455-J6
2R488-J4
2R492-J5
2R519-U12
2R542-U4
2R558-N9
2R559-N10
2R560-P9
2R561-P10

Tubes
2V301-Q12
2V302-K12
2V304-F12
2V326-Q10

2V327-R8
2V328-L8
2V329-K10
2V330-J10
2V331-K11
2V332-G10
2V333-W9
2V334-W11
2V335-V12
2V336-V11
2V337-W12
2V338-W5
2V339-W7
2V340-V4
2V341-W4
2V342-T4
2V343-U4
2V344-V4

Misc.
2M301-B12
2M302-B3
2S301-B9
2S302-Q7
2S303-J11
2S304-L12
2T301-U9
2T302-U6
2K301-N3

Figure 27—Visual Modulator, Front View (Sheet 2 of 2)

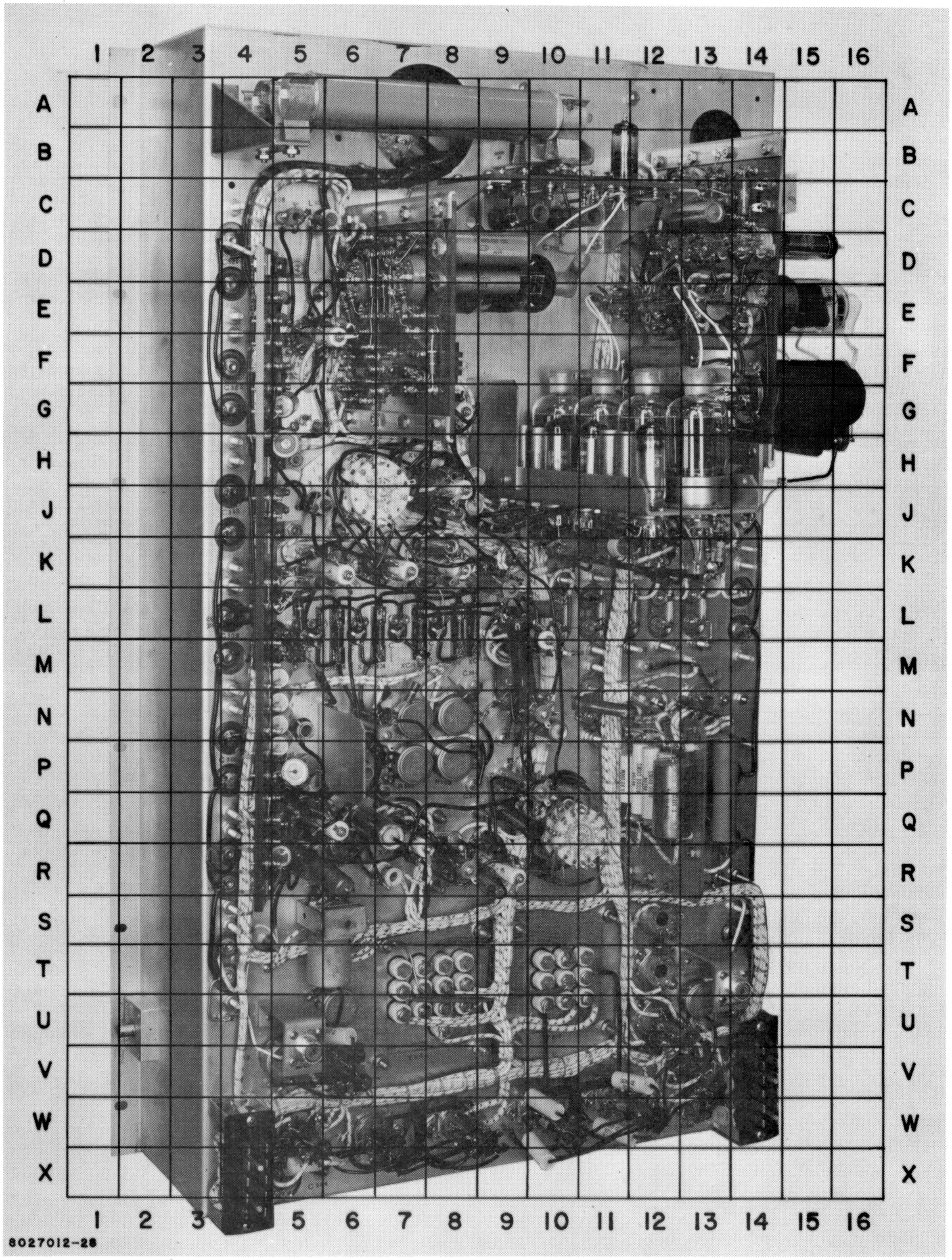

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H J K L M N P Q R S T U V W X
8027012-28

Figure 28—Visual Modulator, Rear View (Sheet 1 of 3)

COMPONENT LOCATION TABLE

By Coordinates

A7 -2R373
A7 -2R372
B7 -2S301
B9 -2TB4
B9 -2R371
B9 -2L310
B9 -2L311
B9 -2XV307
B9 -2V307
B9 -2R374
B9 -2R375
B9 -2R379
B9 -2C320
B12-2C344
B12-2R423
B12-2R422
C5 -2R347
C5 -2L307
C5 -2L308
C13-2TB12
C13-2XV315
C13-2V315
C13-2R425
C13-2R424
C13-2C345
C14-2R429
C14-2R430
C15-2J304
D4 -2C321
D12-2R409
D12-2R410
D12-2R411
D12-2XV321
D12-2V321
D12-2XV320
D12-2V320
D13-2XV319
D13-2V319
D13-2XV318
D13-2V318
D13-2XV310
D13-2V310
D14-2XV317
D14-2V317
D14-2XV316
D15-2V316
E7 -2R358
E7 -2R359
E7 -2TB3
E7 -2C317
E7 -2C315
E7 -2XV306
E7 -2V306
E7 -2R364
E7 -2R362
E7 -2R363
E7 -2R366
E7 -2R367
E7 -2XV305
E7 -2V305
E7 -2R357
E7 -2R361
E7 -2R356
E7 -2R360
E7 -2L309
E7 -2R355
E7 -2R483
E7 -2R365
E11-2C325
E11-2R396
E12-2R431
E12-2R382
E13-2R395
E13-2C324
E13-2R381
E13-2C323
E13-2R394
E13-2R380
E13-2XV309
E13-2V309
E14-2XV308
E15-2V308
F4 -2TB2
F4 -2R350
F4 -2R348
F4 -2R349
F4 -2R369
F4 -2R354
F4 -2C308
F4 -2C314
F6 -2XV304
F6 -2V304
F6 -2C312
F6 -2R338
F6 -2R340
F6 -2R336
F6 -2R341
F6 -2R343
F8 -2E2
F8 -2E3
F12-2R404
F12-2R405
F13-2C380
F14-2TB6
F14-2R387
F14-2R388
F14-2R389
F14-2R420
F14-2R428
F14-2L313
G4 -2C322
G8 -2XV332
G8 -2V332
G8 -2R482
G8 -2R481
G8 -2R487
G8 -2R494
G8 -2R495
G8 -2R496
G12-2R406
G14-2XC333
G15-2C333
H6 -2S303
H9 -2C337
H11-2C335
H11-2C334
H14-2C338
H14-2C399
J4 -2C313
J5 -2R344
J5 -2L306
J8 - 2XV330
J8 -2V330
J8 -2C369
J8 -2C373
J8 -2C372
J8 -2R471
J8 -2R474
J8 -2R473
J8 -2C367
J8 -2R472
J9 -2XV325
J9 -2V325
J10-2XV324
J10-2V324
J10-2XV314
J10-2V314
J10-2R417
J10-2R386
J10-2C332
J10-2R400
J10-2R427
J10-2R421
J10-2C341
J10-2R412
J10-2C340
J10-2R413
J10-2R419
J10-2R418
J10-2R390
J10-2R391
J10-2R392
J10-2R393
J11-2C336
J11-2XV323
J11-2V323
J11-2XV313
J11-2V313
J11-2R416
J11-2R385
J11-2C331
J11-2R399
J11-2C381
J12-2R470
J12-2XV322
J12-2V322
J12-2XV312
J12-2V312
J12-2R415
J12-2R384
J12-2C330
J12-2R398
J13-2XV311
J13-2V311
J13-2R426
J13-2R414
J13-2R383
J13-2C329
J13-2R397
K6 -2XV302
K6 -2V302
K6 -2R480
K6 -2R330
K6 -2R329
K6 -2L305
K6 -2R323
K6 -2R324
K7 -2XV331
K7 -2V331
K7 -2R479
K7 -2R475
K7 -2R484
K7 -2R485
K7 -2R486
K8 -2XV329
K8 -2V329
K8 -2C370
K8 -2C371
K8 -2C368
K8 -2R467
K9 -2TB11
K9 -2R466
K9 -2C366
K9 -2E1
K9 -2R468
K11-2R455
K11-2R450
K12-2R492
K12-2R465
K13-2R488
K13-2B302
K13-2C382
L5 -2R564
L5 -2C398
L6 -2XCR305
L6 -2CR305
L6 -2C392
L7 -2C391
L7 -2XCR304
L7 -2CR304
L7 -2XCR303
L7 -2CR303
L8 -2C390
L8 -2XCR302
L8 -2CR302
L8 -2XCR301
L8 -2CR301
L9 -2R462
L9 -2R463
L9 -2R469
L9 -2XV328
L9 -2V328
L9 -2R464
L9 -2R456
L9 -2R458
L9 -2R459
L9 -2R460
L9 -2R461
L10-2C355
L10-2TB9
L10-2C364
L10-2L312
L10-2C362
L10-2R457
L10-2C361
L11-2C360
L12-2C363
L12-2C365
L14-2C339
M4 -2C309
M5 -2S304
M5 -2R549
M8 -2C394
N4 -2TB1
N4 -2R331
N4 -2R332
N4 -2R333
N4 -2R334
N4 -2R554
N4 -2R555
N4 -2R556
N4 -2R557
N4 -2C304
N4 -2R314
N4 -2R315
N4 -2R316
N4 -2C301
N5 -2L303
N6 -2TB10
N6 -2C306
N6 -2R321
N6 -2R532
N6 -2R553
N7 -2R559
N7 -2R551
N7 -2C395
N8 -2R558
N8 -2R550
N9 -2C358
N11-2C374
N13-2XK301
N13-2R432
P4 -2C305
P5 -2L301
P6 -2L304
P6 -2R318
P6 -2C397
P7 -2R561
P8 -2R560
P8 -2C396
P9 -2TB8
P9 -2R547
P9 -2R448
P9 -2R447
P9 -2R454
P9 -2R548
P13-2TB5
P13-2R545
P13-2R539
P13-2R437
P13-2R438
P13-2C385
P13-2R370
P13-2R408
P13-2R407
P13-2R504
P13-2C387
P14-2C388
Q6 -2XV301
Q6 -2V301
Q6 -2R307
Q6 -2R311
Q6 -2R313
Q6 -2R305
Q6 -2R306
Q6 -2C302
Q6 -2R312
Q6 -2R317
Q6 -2R319
Q6 -2R310
Q7 -2XV326
Q7 -2V326
Q7 -2R441
Q7 -2R440
Q7 -2R442
Q7 -2C350
Q7 -2R433
Q7 -2R434
Q7 -2R435
Q10-2S302
R4 -2C307
R6 -2R320
R7 -2L302
R8 -2TB7
R8 -2R436
R8 -2C354
R8 -2R439
R8 -2R444
R8 -2C359
R9 -2XV327
R9 -2V327
R9 -2R449
R9 -2C356
R9 -2C357
R9 -2R446
R9 -2R445
S6 -2R301
S6 -2R443
S12-2R368
S12-2XV342
S12-2V342
S14-2C383
T4 -2C303
T6 -2B301
T8 -2T301
T10-2T302
T12-2XV343
T12-2V343
T14-2J305
U6 -2R302
U12-2XV344
U12-2V344
U12-2R493
U12-2R491
U12-2R489
U12-2R490
U13-2R542
V5 -2J303
V5 -2R519
V5 -2R303
V5 -2R304
V6 -2XV336
V6 -2V336
V6 -2R520
V6 -2R518
V13-2XV340
V13-2R544
V13-2R563
V13-2R562
V13-2R543
V13-2R541
V13-2R538
V13-2R540
V13-2C400
V13-2C401
V14-2J302
W6 -2XV334
W6 -2V334
W6 -2R508
W6 -2R501
W6 -2R500
W6 -2R513
W6 -2R509
W6 -2R499
W6 -2R512
W8 -2XV333
W8 -2V333
W8 -2R506
W8 -2R498
W8 -2R511
W8 -2R507
W8 -2R497
W8 -2R510
W10-2XV339
W10-2V339
W10-2R533
W10-2R525
W10-2R532
W10-2R537
W10-2R529
W11-2XV338
W11-2V338
W11-2R531
W11-2R534
W11-2R523
W11-2R530
W11-2R535
W11-2R524
W13-2XV341
W13-2V341
X4 -2J301
X5 -2XV335
X5 -2V335
X5 -2R517
X5 -2R515
X5 -2R522
X5 -2R514
X5 -2R521
X5 -2R516
X5 -2C384
X5 -2XV337
X5 -2V337

Figure 28—Visual Modulator, Rear View (Sheet 2 of 3)

COMPONENT LOCATION TABLE

By Symbol Number

Capacitors
2C301-N4
2C302-Q6
2C303-T4
2C304-N4
2C305-P4
2C306-N6
2C307-R4
2C308-F4
2C309-M4
2C312-F6
2C313-J4
2C314-F4
2C315-E7
2C317-E7
2C320-B9
2C321-D4
2C322-G4
2C323-E13
2C324-E13
2C325-E11
2C329-J13
2C330-J12
2C331-J11
2C332-J10
2C333-G15
2C334-H11
2C335-H11
2C336-J11
2C337-H9
2C338-H14
2C339-L14
2C340-J10
2C341-J10
2C344-B12
2C345-C13
2C350-Q7
2C354-R8
2C355-L10
2C356-R9
2C357-R9
2C358-N9
2C359-R8
2C360-L11
2C361-L10
2C362-L10
2C363-L12
2C364-L10
2C365-L12
2C366-K9
2C367-J8
2C368-K8
2C369-J8
2C370-K8
2C371-K8
2C372-J8
2C373-J8
2C374-N11
2C380-F13
2C381-J11
2C382-K13
2C383-S14
2C384-X5
2C385-P13
2C387-P13
2C388-P14
2C390-L8
2C391-L7
2C392-L6
2C394-M8
2C395-N7
2C396-P8
2C397-P6
2C398-L5
2C399-H14
2C400-V13
2C401-V13

Coils
2L301-P5
2L302-R7
2L303-N5
2L304-P6
2L305-K6
2L306-J5
2L307-C5
2L308-C5
2L309-E7
2L310-B9
2L311-B9
2L312-L10
2L313-F14

Resistors
2R301-S6
2R302-U6
2R303-V5
2R304-V5
2R305-Q6
2R306-Q6
2R307-Q6
2R310-Q6
2R311-Q6
2R312-Q6
2R313-Q6
2R314-N4
2R315-N4
2R316-N4
2R317-Q6
2R318-P6
2R319-Q6
2R320-R6
2R321-N6
2R323-K6
2R324-K6
2R329-K6
2R330-K6
2R331-N4
2R332-N4
2R333-N4
2R334-N4
2R336-F6
2R338-F6
2R340-F6
2R341-F6
2R343-F6
2R344-J5
2R347-C5
2R348-F4
2R349-F4
2R350-F4
2R354-F4
2R355-E7
2R356-E7
2R357-E7
2R358-E7
2R359-E7
2R360-E7
2R361-E7
2R362-E7
2R363-E7
2R364-E7
2R365-E7
2R366-E7
2R367-E7
2R368-S12
2R369-F4
2R370-P13
2R371-B9
2R372-A7
2R373-A7
2R374-B9
2R375-B9
2R379-B9
2R380-E13
2R381-E13
2R382-E12
2R383-J13
2R384-J12
2R385-J11
2R386-J10
2R387-F14
2R388-F14
2R389-F14
2R390-J10
2R391-J10
2R392-J10
2R393-J10
2R394-E13
2R395-E13
2R396-E11
2R397-J13
2R398-J12
2R399-J11
2R400-J10
2R404-F12
2R405-F12
2R406-G12
2R407-P13
2R408-P13
2R409-D12
2R410-D12
2R411-D12
2R412-J10
2R413-J10
2R414-J13
2R415-J12
2R416-J11
2R417-J10
2R418-J10
2R419-J10
2R420-F14
2R421-J10
2R422-B12
2R423-B12
2R424-C13
2R425-C13
2R426-J13
2R427-J10
2R428-F14
2R429-C14
2R430-C14
2R431-E12
2R432-N13
2R433-Q7
2R434-Q7
2R435-Q7
2R436-R8
2R437-P13
2R438-P13
2R439-R8
2R440-Q7
2R441-Q7
2R442-Q7
2R443-S6
2R444-R8
2R445-R9
2R446-R9
2R447-P9
2R448-P9
2R449-R9
2R450-K11
2R454-P9
2R455-K11
2R456-L9
2R457-L10
2R458-L9
2R459-L9
2R460-L9
2R461-L9
2R462-L9
2R463-L9
2R464-L9
2R465-K12
2R466-K9
2R467-K8
2R468-K9
2R469-L9
2R470-J12
2R471-J8
2R472-J8
2R473-J8
2R474-J8
2R475-K7
2R479-K7
2R480-K6
2R481-G8
2R482-G8
2R483-E7
2R484-K7
2R485-K7
2R486-K7
2R487-G8
2R488-K13
2R489-U12
2R490-U12
2R491-U12
2R492-K12
2R493-U12
2R494-G8
2R495-G8
2R496-G8
2R497-W8
2R498-W8
2R499-W6
2R500-W6
2R501-W6
2R504-P13
2R506-W8
2R507-W8
2R508-W6
2R509-W6
2R510-W8
2R511-W8
2R512-W6
2R513-W6
2R514-X5
2R515-X5
2R516-X5
2R517-X5
2R518-V6
2R519-V5
2R520 -V6
2R521 -X5
2R522 -X5
2R523 -W11
2R524 -W11
2R525 -W10
2R529 -W10
2R530 -W11
2R531 -W11
2R532 -W10
2R533 -W10
2R534 -W11
2R535 -W11
2R537 -W10
2R538 -V13
2R539 -P13
2R540 -V13
2R541 -V13
2R542 -U13
2R543 -V13
2R544 -V13
2R545 -P13
2R547 -P9
2R548 -P9
2R549 -M5
2R550 -N8
2R551 -N7
2R553 -N6
2R554 -N4
2R555 -N4
2R556 -N4
2R557 -N4
2R558 -N8
2R559 -N7
2R560 -P8
2R561 -P7
2R562 -V13
2R563 -V13
2R564 -L5

Sockets
2XV301-Q6
2XV302-K6
2XV304-F6
2XV305-E7
2XV306-E7
2XV307-B9
2XV308-E14
2XV309-E13
2XV310-D13
2XV311-J13
2XV312-J12
2XV313-J11
2XV314-J10
2XV315-C13
2XV316-D14
2XV317-D14
2XV318 -D13
2XV319 -D13
2XV320 -D12
2XV321 -D12
2XV322 -J12
2XV323 -J11
2XV324 -J10
2XV325 -J9
2XV326 -Q7
2XV327 -R9
2XV328 -L9
2XV329 -K8
2XV330 -J8
2XV331 -K1
2XV332 -G8
2XV333 -W8
2XV334 -W6
2XV335 -X5
2XV336 -V6
2XV337 -X5
2XV338 -W11
2XV339 -W10
2XV340 -V13
2XV341 -W13
2XV342 -S12
2XV343 -T12
2XV344 -U12
2XK301 -N13
2XCR301-L8
2XCR302-L8
2XCR303-L7
2XCR304-L7
2XCR305-L6
2XC333 -G14

Term. Bds.
2TB1 -N4
2TB2 -F4
2TB3 -E7
2TB4 -B9
2TB5 -P13
2TB6 -F14
2TB7 -R8
2TB8 -P9
2TB9 -L10
2TB10 -N6
2TB11 -K9
2TB12 -C13

Tubes
2V301 -Q6
2V302 -K6
2V304 -F6
2V305 -E7
2V306 -E7
2V307 -B9
2V308 -E15
2V309 -E13
2V310 -D13
2V311 -J13
2V312 -J12
2V313 -J11
2V314 -J10
2V315 -C13
2V316 -D15
2V317 -D14
2V318 -D13
2V319 -D13
2V320 -D12
2V321 -D12
2V322 -J12
2V323 -J11
2V324 -J10
2V325 -J9
2V326 -Q7
2V327 -R9
2V328 -L9
2V329 -K8
2V330 -J8
2V331 -K7
2V332 -G8
2V333 -W8
2V334 -W6
2V335 -X5
2V336 -V6
2V337 -X5
2V338 -W11
2V339 -W10
2V340 -V13
2V341 -W13
2V342 -S12
2V343 -T12
2V344 -U12

Misc.
2B301 -T6
2B302 -K13
2CR301-L8
2CR302-L8
2CR303-L7
2CR304-L7
2CR305-L6
2E1 -K9
2E2 -F8
2E3 -F8
2J301 -X4
2J302 -V14
2J303 -V5
2J304 -C15
2J305 -T14
2S302 -Q10
2S303 -H6
2S304 -M5
2T301 -T8
2T302 -T10

Figure 28—Visual Modulator, Rear View (Sheet 3 of 3)

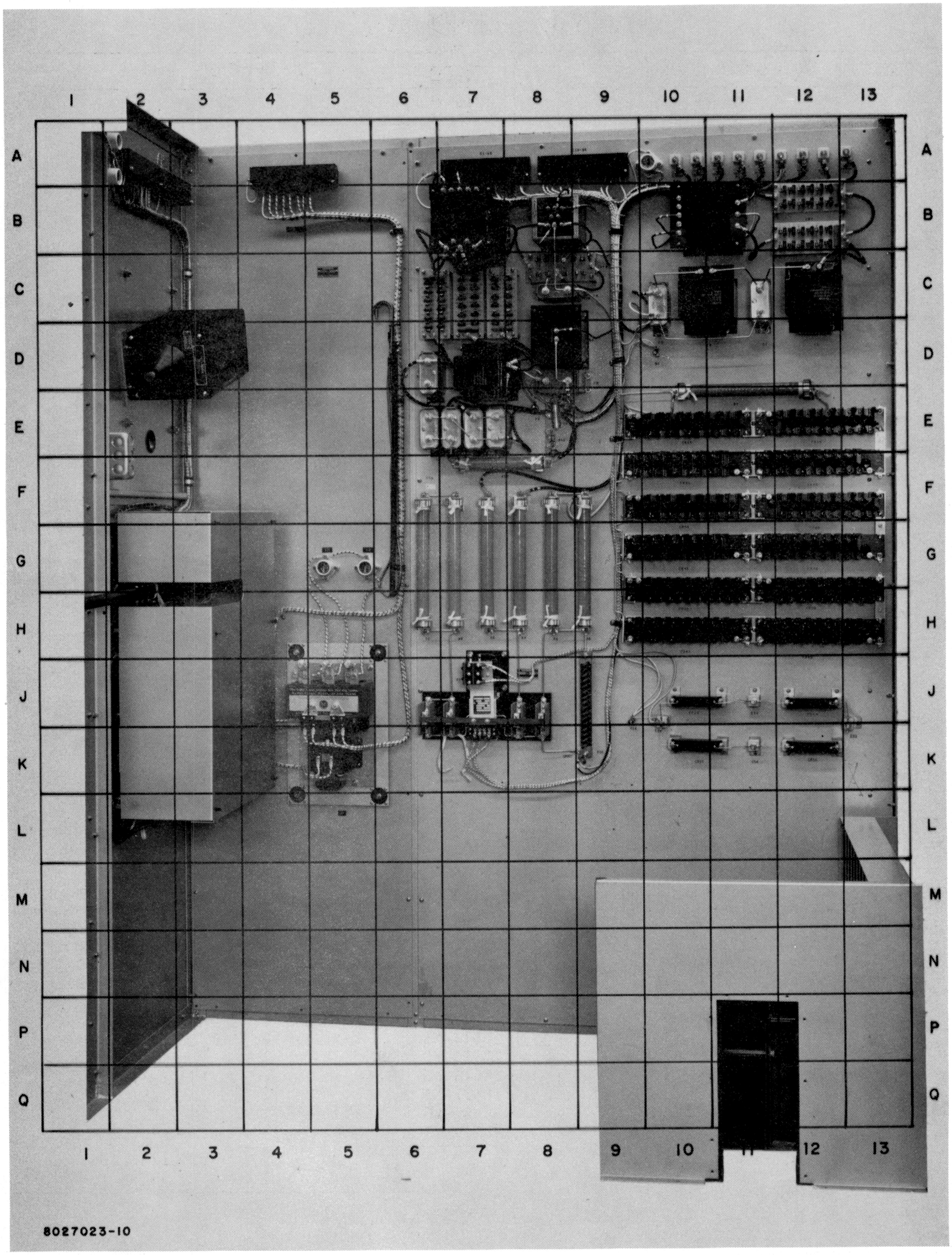

1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
8027023-10

Figure 29—Rear Enclosure Components (Sheet 1 of 2)

COMPONENT LOCATION TABLE

By Coordinates

A2-11X13
A2-11X14
A10-12X11
B7-12T2
B8-12T3
B10-12T1
B12-12CR7
B12-12CR8
C6-12CR11
C7-12CR9
C7-12CR10
C8-12CR12
C8-12C8
C10-12C2
C10-12L2
C11-12C1
C12-12L1
D2-11R1
D6-12C5
D7-12L3
D8-12L4
D8-12C9
D10-12R8
E2-11S4
E6-12R13
E6-12C7
E7-12C3
E7-12C4
E7-12C6
E8-12R9
E8-12C10
E8-12R11
E8-12R12
E10-12CR1A
E11-12R7
E12-12CR1B
F7-12R10
F10-12CR2A
F10-12CR3A
F12-12CR2B
F12-12CR3B
G2-11T1
G3-11T2
G3-11S3
G5-11X11
G5-11X12
G6-12R1
G7-12R2
G7-12R3
G8-12R4
G8-12R5
G9-12R6
G10-12CR4A
G12-12CR4B
H10-12CR5A
H10-12CR6A
H12-12CR5B
H12-12CR6B
J2-11S1
J3-11S2
J5-11K1
J7-12K1
J9-12R14
J9-12R16
J10-12CR13
J12-12CR14
K9-12R15
K10-12CR15
K12-12CR16

By Symbol

Capacitors

12C1-C11
12C2-C10
12C3-E7
12C4-E7
12C5-D6
12C6-E7
12C7-E6
12C8-C8
12C9-D8
12C10-E8

Rectifiers

12CR1A-E10
12CR1B-E12
12CR2A-F10
12CR2B-F12
12CR3A-F10
12CR3B-F12
12CR4A-G10
12CR4B-G12
12CR5A-H10
12CR5B-H12
12CR6A-H10
12CR6B-H12
12CR7-B12
12CR8-B12
12CR9-C7
12CR10-C7
12CR11-C6
12CR12-C8
12CR13-J10
12CR14-J12
12CR15-K10
12CR16-K12

Relays

11K1-J5
12K1-J7

Inductors

12L1-C12
12L2-C10
12L3-D7
12L4-D8

Resistors

11R1-D2
12R1-G6
12R2-G7
12R3-G7
12R4-G8
12R5-G8
12R6-G9
12R7-E11
12R8-D10
12R9-E8
12R10-F7
12R11-E8
12R12-E8
12R13-E6
12R14-J9
12R15-K9
12R16-J9

Switches

11S1-J2
11S2-J3
11S3-G3
11S4-E2

Transformers

11T1-G2
11T2-G3
12T1-B10
12T2-B7
12T3-B8

Indicators

11X11-G5
11X12-G5
11X13-A2
11X14-A2
12X11-A10

Figure 29—Rear Enclosure Components (Sheet 2 of 2)

REPLACEMENT PARTS LIST

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 1			MI-27180-B CONTROL UNIT
B1	210369	479004- 1	MOTOR
B2	210369	479004- 1	MOTOR
C1	610003	36655-503	CAPACITOR ASSEMBLY - METER BYPASS .01 MF
C2	610003	36655-503	CAPACITOR ASSEMBLY - METER BYPASS .01 MF
C3	610003	36655-503	CAPACITOR ASSEMBLY - METER BYPASS .01 MF
C4	55018	863691- 2	CAPACITOR - 1.2 MF
C5	55018	863691- 2	CAPACITOR - 1.2 MF
F1	300218	990157- 8	FUSE - 1 AMP OVERLOAD INDICATOR LIGHTS
F2	300153	990157- 10	FUSE - 2 AMP OVERLOAD LIGHT RELAYS
F3	300218	990157- 8	FUSE - 1 AMP CONTROL MOTORS
F4	300153	990157- 10	FUSE - 2 AMP VOLTAGE REGULATOR MOTOR
F5 TO F10	300218	990157- 8	FUSE - 1 AMP AC METERING
HR1 TO HR8			HEATER - THERMAL OVERLOAD, PT OF INSTAL MAT
I1A	300449	8890654- 2	LAMP - INDICATOR, INTERLOCKS
I1B	300449	8890654- 2	LAMP - INDICATOR, INTERLOCKS
I2A	300449	8890654- 2	LAMP - INDICATOR, FILAMENT ON
I2B	300449	8890654- 2	LAMP - INDICATOR, FILAMENT ON
I3A	300449	8890654- 2	LAMP - INDICATOR, TRANSMITTER ON
I3B	300449	8890654- 2	LAMP - INDICATOR, TRANSMITTER ON
I4A	300449	8890654- 2	LAMP - INDICATOR, TRANSMITTER OFF
I4B	300449	8890654- 2	LAMP - INDICATOR, TRANSMITTER OFF
I5A	300449	8890654- 2	LAMP - INDICATOR, PLATE READY
I5B	300449	8890654- 2	LAMP - INDICATOR, PLATE READY
I6A	300449	8890654- 2	LAMP - INDICATOR, PLATE ON
I6B	300449	8890654- 2	LAMP - INDICATOR, PLATE ON
I7A	300449	8890654- 2	LAMP - INDICATOR, PLATE OFF
I7B	300449	8890654- 2	LAMP - INDICATOR, PLATE OFF
I8A	300449	8890654- 2	LAMP - INDICATOR, OVERLOAD
I8B	300449	8890654- 2	LAMP - INDICATOR, OVERLOAD
I11A TO I11T	210406	856763- 3	LAMP - INDICATOR, OVERLOAD
K1	215842	457078- 4	CONTACTOR - BLOWER MOTOR (LESS HEATERS)
	97576		CONTACTS - STATIONARY (3 REQD)
	97575		CONTACTS - MOVING (3 REQD)
	97577		CONTACTS - SPRING (3 REQD)
	211430		COIL - 110 V., 60 CYCLE
	211063	8976338- 1	RELAY - THERMAL OVERLOAD
K2	210399	457078- 3	CONTACTOR - FILAMENT (LESS HEATERS)
	97579		INTERLOCK (N.O.)
	97575		CONTACT - MOVING (3 REQD)
	97576		CONTACT - STATIONARY (3 REQD)
	97577		CONTACT - SPRING (3 REQD)
	211430		COIL - 110 V. 60 CYCLE
K3	210401	429587- 23	RELAY - PLATE TIME DELAY
	211063	8976338- 1	RELAY - THERMAL OVERLOAD
	206329		COIL
K4	235914	8836937- 10	LINE STARTER - MODULATOR AND BIAS
	97050	8836937- 4	CONTACTS - MOVING (3 REQD)
	97051	8836937- 5	CONTACTS - STATIONARY (3 REQD)
	97052	8836937- 6	CONTACT - SPRING (3 REQD)
	211430		COIL
	211063	8976338- 1	RELAY - THERMAL OVERLOAD
K5	44938	440489- 4	RELAY - MODULATOR AND BIAS AUX.
	44940		COIL
	44545		CONTACT - SET (2 STAT., 2 MOVABLE)
K6	210398	8836937- 13	CONTACTOR - LOW VOLTAGE (LESS HEATERS)
	97050	8836937- 4	CONTACTS - MOVING (3 REQD)
	97051	8836937- 5	CONTACTS - STATIONARY (3 REQD)
	97052	8836937- 6	CONTACT - SPRING (3 REQD)
	211430		COIL
	97569		INTERLOCK
	211063	8976338- 1	RELAY - THERMAL OVERLOAD
K7	210400	445100- 5	RELAY - NOTCHING AND RESET
	212242	445100- 11	COIL - OPERATING

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 1			
	212241	445100- 21	COIL - RELEASE
K8	210402	433748- 3	RELAY - OVERLOAD AUX.
	212230	433748- 23	COIL
	44942		CONTACTS - SET, INCLUDES 2 STAT. (MAKE) 2 STAT. (BREAK) 2 MOVABLE (1 LEFT, 1 RIGHT)
K9	210403	8910603- 1	RELAY - OVERLOAD TIME DELAY
	55574	440326- 44	COIL
	17535	440326- 50	CONTACT - STATIONARY
	17537	440326- 51	CONTACT - MOVABLE
K10	95949	440326- 5	RELAY - OVERLOAD
K11	95949	440326- 5	RELAY - OVERLOAD
K12	95949	440326- 5	RELAY - OVERLOAD
K13 TO			
K22	210404	754291- 1	RELAY - ADJ.
K23	217988	480003- 5	RELAY - LATCHING, TRANSMITTER ON-OFF
K24	217988	480003- 5	RELAY - LATCHING, PLATE ON-OFF
K31 TO			
K47	210405	627511- 37	RELAY - O.L. IND. CKT.
M1	235912	993053-119	METER - 0-1 KV DC
M2	229781	993057- 66	METER - 0-300 VAC
M3	229784	993053-176	METER - 0-8 KV DC
M4	230798	8489369- 1	METER - ELAPSED TIME
			RESISTORS - FIXED COMPOSITION, UNLESS NOTED
R1			RESISTOR - PART OF LOW VOLTAGE REGULATOR
R2	43457	99029- 21	RESISTOR - 100 OHMS 45 W
R3	210365	433464- 19	RESISTOR - 5000 OHMS 400 W
R4	19687	99031- 38	RESISTOR - 5000 OHMS 55 W
R5	56088	415724- 7	RESISTOR - 4500 OHMS 150 W
R6	210366	99033- 38	RESISTOR - 5000 OHMS 95 W
R7	52076	99029- 33	RESISTOR - 1600 OHMS 45 W
R9			RESISTOR - PART OF INSTALLATION MATERIAL
R10			RESISTOR - PART OF INSTALLATION MATERIAL
R12			RESISTOR - PART OF INSTALLATION MATERIAL
R13	56377	99027- 41	RESISTOR - 10,000 OHMS 25 W
R14	237214	8702674-501	RESISTOR - ASSEMBLY, 1.0 MEGOHM
R21 TO			
R28	59941	993007- 86	RESISTOR - 1800 OHMS ±10% 5 W
S1	94108	8896322- 3	CIRCUIT BREAKER - CONTROL VOLTAGE
S2	210364	8910613- 1	SWITCH - 3PST, 30 A FILAMENTS
S3	44953	870199- 5	SWITCH - 2PST, 30 A LOW VOLTAGE
S4	44953	870199- 5	SWITCH - 2PST, 30 A EXCITER
S5	44953	870199- 5	SWITCH - 2PST, 30 A BIAS
S6	44953	870199- 5	SWITCH - 2PST, 30 A MODULATOR
S7	44953	870199- 5	SWITCH - 2PST, 30 A SINGLE-MULTIPLE
S8	230828	8498764- 4	SWITCH - SPST, OFF-FREQUENCY INTLK BYPASS
S9	230827	8498764- 3	SWITCH - SPST, OVERLOAD LIGHT RESET
S10	230786	8494423- 2	SWITCH - AC METERING
S13	229798	8543376- 1	SWITCH - TRANSMITTER ON
S14	229798	8543376- 1	SWITCH - TRANSMITTER OFF
S15	229799	8543375- 1	SWITCH - TIME DELAY BYPASS
S16	229798	8543376- 1	SWITCH - PLATE ON
S17	229798	8543376- 1	SWITCH - PLATE OFF
S18	229798	8543376- 1	SWITCH - OVERLOAD RESET
T1	215944	8415073- 4	TRANSFORMER - CONTROL
T2	210397	474842- 1	TRANSFORMER - OVERLOAD LIGHTS
XF1 TO		-	
XF10	211618	8817617- 1	SOCKET - FUSE
X11	269851	8522913- 1	INDICATOR - LAMP SOCKET
X12	269851	8522913- 1	INDICATOR - LAMP SOCKET
X13 TO			
X18	270023	8522913- 4	INDICATOR - LAMP SOCKET
X111	210412	479008- 1	STRIP - OVERLOAD LIGHTS, SOCKET
			MISCELLANEOUS
	210409	8903398- 7	JEWEL - LAMP CAP, CLEAR
	210408	8903398- 6	JEWEL - LAMP CAP, GREEN

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 1			
	210407	8903398- 5	JEWEL - LAMP CAP, RED
	52717	7862770- 1	CLIP - FUSE, FOR 1 1/16 IN. DIA. FERRULE
	209711	426773- 9	INSULATOR - STEAT., 3/4 SQ X 1.5 LG
	42736	99045- 4	CLIP - MOUNTING, FOR 13/16 IN. DIA FERRULE
	53325	99045- 5	CLIP - MOUNTING, FOR 9/16 IN. DIA. FERRULE
	99043	426762- 9	INSULATOR - STEAT., 5/8 X 1 1/8 X 2
	235852	3467690-506	KNOB ASSEMBLY FOR S10
	51411	8888539-124	SCREW - SET, 6-32 X 0.31 LG
	269689	8522915- 1	BARRIER - MOUNTING, SHORT, FOR X11 TO X18
	231046	8494089- 35	SCREEN - INTERLOCKS
	231045	8494089- 34	SCREEN - FILAMENT-ON
	231042	8494089- 36	SCREEN - TRANSMITTER-ON-AIR ON
	235853	8494089- 53	SCREEN - TRANSMITTER-OFF
	235854	8494089- 54	SCREEN - PLATE-READY-T.D. BYPASS
	229893	8494089- 5	SCREEN - PLATE-ON
	229811	8494089- 4	SCREEN - PLATE-OFF
	231044	8494089- 32	SCREEN - OVERLOAD-O.L. RESET
			MI-27469-A LOW VOLTAGE REGULATOR
			CAPACITORS
C201	805004-4	36091-520	CAPACITOR - METER BY-PASS .005 MF, 500 V
C202	57547	984680- 57	CAPACITOR - PAPER .5 MF, 600 V
C203	57547	984680- 57	CAPACITOR - PAPER .5 MF, 600 V
C204	18118	990193- 29	CAPACITOR - PAPER 10 MF, ±10%, 1000 V
C205	56117	984680- 55	CAPACITOR - PAPER .1 MF, 600 V
CR201	211707	8865057- 2	THYRITE - 350 V ±16%, AT 1.0 AMP, 10 W
CR202	212131	8865057- 3	THYRITE - 1735 V ±18%, AT 0.0025 AMP, 3.5 W
M201	235855	993104- 1	METER
			RESISTORS, FIXED COMPOSITION UNLESS NOTED
R201	205044	433196- 19	VARIABLE 100,000 OHMS, ±10%, 2 W
R202	522427	99126- 91	270,000 OHMS, ±10%, 2 W
R203	19550	99027- 38	W.W. 5000 OHMS, ±10%, 25 W
R204	56377	99027- 41	W.W. 10,000 OHMS, ±10%, 25 W
R205	512347	90496- 82	47,000 OHMS, ±10%, 1 W
R206	512510	90496- 98	1.0 MEG OHM, ±10%, 1 W
R207	512439	90496- 93	390,000 OHMS, ±10%, 1 W
R208	522382	99126-205	82,000 OHMS, ±5%, 2 W
R209	522422	99126- 90	220,000 OHMS, ±10%, 2 W
R210	502110	82283- 50	100 OHMS, ±10%, 1/2 W
R211	502047	90496- 46	47 OHMS, ±10%, 1 W
R212	95656	8871557- 30	W.W. 100 OHMS, ±1%, 2 W
R213	502110	82283- 50	100 OHMS, ±10%, 1/2 W
R214	502047	90496- 46	47 OHMS, ±10%, 1 W
R215	95656	8871557- 30	W.W. 100 OHMS, ±1%, 2 W
R216	502110	82283- 50	100 OHMS, ±10%, 1/2 W
R217	502047	90496- 46	47 OHMS, ±10%, 1 W
R218	95656	8871557- 30	W.W. 100 OHMS, ±1%, 2 W
R219	502110	82283- 50	100 OHMS, ±10%, 1/2 W
R220	502047	90496- 46	47 OHMS, ±10%, 1 W
R221	95656	8871557- 30	W.W. 100 OHMS, ±1%, 2 W
R222	502110	82283- 50	100 OHMS, ±10%, 1/2 W
R223	502047	90496- 46	47 OHMS, ±10%, 1 W
R224	95656	8871557- 30	W.W. 100 OHMS, ±1%, 2 W
R225	502110	82283- 50	100 OHMS, ±10%, 1/2 W
R226	502047	90496- 46	47 OHMS, ±10%, 1 W
R227	95656	8871557- 30	W.W. 100 OHMS, ±1%, 2 W
R228	512347	90496- 82	47,000 OHMS, ±10%, 1 W
R229	212130	990187-547	FILM 301,000 OHMS, ±1%, 1 W
R230	522327	99126- 79	27,000 OHMS, ±10%, 2 W
R231	522327	99126- 79	27,000 OHMS, ±10%, 2 W
R232	207243	990187-401	FILM 10,000 OHMS ±1%, 1 W
R233	210886	990187-568	FILM .499 MEGOHM ±1%, 1 W

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 1			
R234	210886	990187-568	FILM .499 MEGOHM ±1%, 1 W
S201	212132	461205- 5	SWITCH - ROTARY, 2 SEC., 12 POS., 3 POLE
T201	212129	476469- 1	TRANSFORMER - FILAMENT
XV201	68590	99100- 5	SOCKET - TUBE, OCTAL
XV202	98487	742413- 2	SOCKET - TUBE, 7 PIN MINIATURE
XV203	98487	742413- 2	SOCKET - TUBE, 7 PIN MINIATURE
XV204	210645	746048- 5	SOCKET - OCTAL
XV205	210645	746048- 5	SOCKET - OCTAL
XV206	210645	746048- 5	SOCKET - OCTAL
			MISCELLANEOUS
	53325	99045- 5	CLIP - MOUNTING
	209711	426773- 9	INSULATOR - STEAT., 1 1/2 IN LG X 3/4 SQ
	208524	426764- 9	INSULATOR - STEAT., 7/8 IN LG X 3/4 DIA
	97458	426767- 6	INSULATOR - STEAT., 1 1/4 IN LG X 3/4 DIA
	238034	1510922-113	KNOB FOR S201
PREFIX 2			
			MI-34570-A 6KW DRIVER UNIT
			CAPACITORS
C1 TO C7	610003	36655-503	CAPACITOR ASSEMBLY - METER BYPASS, .01 MF
C8	238059	8543387- 5	CERAMIC, 3 PF 5 KV
CR1	230733	8722935-503	RECTIFIER - ASSEMBLY
CR2	67876		DIODE - TYPE 1N21B (USED IN Z2)
I1A	300449	8890654- 2	LAMP - AURAL OFF FREQUENCY INDICATOR
I1B	300449	8890654- 2	LAMP - AURAL OFF FREQUENCY INDICATOR
12A	300449	8890654- 2	LAMP - VISUAL MOD. AMPL. BIAS INDICATOR
12B	300449	8890654- 2	LAMP - VISUAL MOD. AMPL. BIAS INDICATOR
J4	92180	433647- 1	CONNECTOR - INPUT TO Z2
K1	235839	8958260- 5	RELAY - MODULATED AMPLIFIER BIAS AUXILIARY
M1			METER - AURAL REFLECTOMETER
M2			METER - 2ND AURAL AMPLIFIER PLATE CURRENT
M3	238036	993053-123	METER - 0-3KV, INT. H.V.
M4	235835	993064- 5	METER - MULTIMETER
M5	239402	993063- 8	METER - 0-500V, MODULATED AMPLIFIER BIAS
M6	229895	993052-153	METER - 0-2A, MODULATED AMPL. PLATE CURRENT
M7	235836	993064- 6	METER - VISUAL REFLECTOMETER
P5	921359	1510013-101	CONNECTOR - Z2 OUTPUT
			RESISTOR - FIXED COMPOSITION, UNLESS NOTED
R1			RESISTOR - VARIABLE, 500,000 OHMS PT OF S3
R2	211687	99317- 11	WIRE WOUND, 33.55 OHMS ±1% 1 W
R3	96538	8857185- 10	WIRE WOUND, 300 OHMS ±5% 25 W
R4	211069	99317- 15	WIRE WOUND, 4.61 OHMS ±1% 1 W
R5	211687	99317- 11	WIRE WOUND, 33.55 OHMS ±1% 1 W
R6	102241	993008-101	WIRE WOUND, 10,000 OHMS ±5% 10 W
R7	214941	993007-107	WIRE WOUND, 20,000 OHMS ±5% 5 W
R8	214941	993007-107	WIRE WOUND, 20,000 OHMS ±5% 5 W
R9	214941	993007-107	WIRE WOUND, 20,000 OHMS ±5% 5 W
R10	214941	993007-107	WIRE WOUND, 20,000 OHMS ±5% 5 W
R11	217830	99317- 12	WIRE WOUND, 1.25 OHMS ±1% 1 W
R12	217829	99317- 13	WIRE WOUND, 1.75 OHMS ±1% 1 W
R13	228077	990733-618	FILM, 1.5 MEGOHMS ±1% 1 W
R14	228077	990733-618	FILM, 1.5 MEGOHMS ±1% 1 W
R15	522451	99126-224	510,000 OHMS ±5% 2 W
R18	228077	990733-618	RESISTOR - 1.5 MEGOHM ±1% 1 W
R19	225076	8908855- 5	WIREWOUND, 0.5 OHMS ±5% 25 W
R20	215840	204777- 7	RHEOSTAT - 12 OHMS 50 W
R21	211074	891769- 18	WIRE WOUND, 5 MEGOHMS ±1% 2 W
R22	51598	99317- 4	WIRE WOUND 10 OHMS ±1% 1 W
R23	225077	990188-339	FILM, 2490 OHMS ±1% 1 W
R24	225077	990188-339	FILM, 2490 OHMS ±1% 1 W
R26	211687	99317- 11	WIRE WOUND, 33.55 OHMS ±1% 1 W
R27	230816	8702674-506	CIRCUIT - 3 MEGOHMS (RESISTOR ASSEMBLY)

Symbol	Stock No.	Drawing No.	Description
PREFIX 2			
R28			RESISTOR - VARIABLE, 500,000 OHMS PT OF S1
R29	96543	8857185- 15	WIRE WOUND, 20,000 OHMS ±5% 25 W
R30	96556	8857185- 4	WIRE WOUND, 16,000 OHMS ±5% 25 W
R31	215861	8857185- 29	WIRE WOUND, 5000 OHMS ±5% 50 W
R32	522322	99126-191	22,000 OHMS ±5% 2 W
R33	522322	99126-191	22,000 OHMS ±5% 2 W
R34	522322	99126-191	22,000 OHMS ±5% 2 W
R35	522322	99126-191	22,000 OHMS ±5% 2 W
R36	102241	993008-101	WIRE WOUND, 10,000 OHMS ±5% 10 W
R37	211687	99317- 11	WIRE WOUND, 33.55 OHMS ±1% 1 W
R38	211069	99317- 15	WIRE WOUND, 4.61 OHMS ±1% 1 W
R39	231005	993007- 13	WIRE WOUND, 0.4 OHMS ±10% 5 W
R40	215840	204777- 7	RHEOSTAT - 12 OHMS 50 W
R41	211687	99317- 11	RESISTOR - 33,550 OHMS ±1% 1 W
R42	211074	891769- 18	WIRE WOUND, 5 MEGOHMS ±1% 2 W
R43	211074	891769- 18	WIRE WOUND, 5 MEGOHMS ±1% 2 W
R44	522451	99126-224	510,000 OHMS ±5% 2 W
R45	51598	99317- 4	WIREWOUND, 10 OHMS ±1% 1 W
R46	99382	99317- 59	WIREWOUND, 3.33 OHMS ±1% 1 W
R47	512351	90496-200	51,000 OHMS ±5% 1 W
R48	512410	90496-207	100,000 OHMS ±5% 1 W
R49	512410	90496-207	100,000 OHMS ±5% 1 W
R50	512356	90496- 83	56,000 OHMS ±10% 1 W
R51	59941	993007- 86	RESISTOR - 1800 OHMS 5 W
R52	59941	993007- 86	RESISTOR - 1800 OHMS 5 W
R53	522422	99126- 90	220,000 OHMS ±10% 2 W
R54	502018	82283-117	18 OHMS ±5% 1/2 W
S1		3462788- 1	SWITCH - AURAL REFLECTOMETER
S1	235864		ROTARY SWITCH ONLY
S1	235865		VARIABLE RESISTOR ONLY, 500,000 OHMS
S2	235837	8431807- 8	SWITCH - MULTIMETER
S3		3462788- 1	SWITCH - VISUAL REFLECTOMETER
S3	235864		ROTARY SWITCH ONLY
S3	235865		VARIABLE RESISTOR ONLY, 500,000 OHMS
S4	230825	8498764- 1	SWITCH - AURAL EXCITATION
S5	230825	8498764- 1	SWITCH - VIDEO GAIN
S6	230825	8498764- 1	SWITCH - PEDESTAL LEVEL
S7	230825	8498764- 1	SWITCH - VISUAL EXCITATION
S8	54920	8881052- 1	SWITCH - MODULATOR PANEL INTERLOCK
S9	235838	3467618- 1	SWITCH - AIR PRESSURE INTERLOCK
S10	54920	8881052- 1	SWITCH - METER PANEL INTERLOCK
T1	225078	8465133- 1	TRANSFORMER - FILAMENT, FIRST AURAL AMPLIFIER
T2	225079	8411065- 1	TRANSFORMER - FILAMENT, SECOND AURAL AMPLIFIER
T3	215846	476484- 2	TRANSFORMER - FILAMENT, REFLECTOMETER
T4	225078	8465133- 1	TRANSFORMER - FILAMENT, FIRST AND SECOND VISUAL AMPLIFIER
T5	225079	8411065- 1	TRANSFORMER - FILAMENT, VISUAL MODULATOR AMPLIFIER
T8	225080	8466463- 1	TRANSFORMER - MODULATOR CONTROL MOTORS
XI1	269851	8522913- 1	INDICATOR - LAMP SOCKET
XI2	269851	8522913- 1	INDICATOR - LAMP SOCKET
Z1	212214	8920939- 1	COUPLER - DIRECTIONAL, SWAMPING INDICATOR
Z2	239081	3455490- 1	CRYSTAL MOUNT - GRID TRAP TUNING
			MISCELLANEOUS
		8642690-501	COUNTER ASSY - L605 AND L658 TUNING DRIVE
		8642690-502	COUNTER ASSY - C626 AND C691 TUNING DRIVE
		8642690-503	COUNTER ASSY - C690 TUNING DRIVE
		8642690-504	COUNTER ASSY - L663 TUNING DRIVE
	214657	8914897- 2	BLOCK - BEARING ASSEMBLY
	207735	8827596- 1	COUNTER
	208091	897158- 5	COUPLING
	97461	8827138- 2	GEAR
	212531	8914895-501	GEAR ASSEMBLY
	208040	891997- 33	LUBRICANT - MOLYKOTE, TYPE 2

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
	251825	990331-143	PIN
	70527	8888539-122	SCREW - SET, .138(6)-32 X .187 LONG
	231298	3462916- 4	SPROCKET - 30 TEETH, 2.39 PITCH DIA
	231115	8880670- 14	CHAIN - 48 INCHES LONG
	251825	990331-143	PIN - SPRING, 3/8 LONG
	211297	8910643- 2	JOINT - UNIVERSAL
	231295	8946214- 3	DRIVE - RIGHT ANGLE 3 TO 1 RATIO
	231296	8838035-502	SPROCKET - ASSEMBLY, 15 TEETH
	231297	8838035-504	SPROCKET - ASSEMBLY, 30 TEETH
	210376	426766- 9	INSULATOR - STEATITE, 1/2 IN DIA X 1 IN LG
	211107	8907728- 1	CONTACT - SPRING, MOD. OUTPUT JACK J304 (2 REQD)
	210375	426774- 6	INSULATOR - STEATITE, 1 IN SQ X 2 IN LONG
	94426	897258- 2	CLAMP - ADJUSTABLE, 11/16 IN TO 2 IN I.D.
	214316	885655- 10	BEARING - BALL, L610 AND L663 DRIVE
	235870	8858926- 2	LINK - OFFSET
	99899	8811014- 1	LINK - MASTER LINK FOR CHAIN
		8642690-511	COUNTER ASSEMBLY, L610 TUNING DRIVE
	207735	8827596- 1	COUNTER
	212531	8914895-501	GEAR ASSEMBLY
	97461	8827138- 2	GEAR (3 USED)
	70527	8888539-122	SCREW - SET, 6-32 X 3/16 LG
	214657	885655- 10	BEARING - BLOCK ASSEMBLY
	208040	891997- 33	LUBRICANT - MOLYKOTE POWDER
	233390	8466415- 1	GASKET - SPONGE RUBBER 15.12 LG X 4.00 WIDE
	208040	891997- 33	LUBRICANT - MOLYKOTE POWDER, 5/8 OZ VIAL
	210863	8811154- 13	CLAMP - CABLE, 13/16 DIAMETER
	51929	727969- 12	CONNECTOR - FEMALE, 10 CONTACTS (P301)
	70527	8888539-122	SCREW - SET, 6-32 X .19 LONG
	101589	8888539-183	SCREW - SET, 10-32 X .25 LONG
	235847	1510922-108	KNOB FOR R20 AND R40
	231058	8549962-501	KNOB FOR R1 AND R28
	231172	8544724- 1	PIN - DOOR HINGE
	94641	8914329- 1	FASTENER - RECEPTACLE, METER PANEL
	233868	480368- 6	STUD - TURNLOCK FASTENER, METER PANEL
	98480	8886047- 3	WASHER - RETAINING, FOR TURNLOCK FASTENER
	235849	3467668- 2	GAGE - AIR PRESSURE
	236254	480099-503	TUBE - PLASTIC, WITH FITTINGS, AIR PRESSURE CONNECT
	269689	8522915- 1	BARRIER - MOUNTING BARRIER SHORT, FOR XI1 AND XI2
	235845	8494089- 55	SCREEN - DISPLAY, AURAL OFF FREQUENCY
	235846	8494089- 56	SCREEN - DISPLAY, MODULATED AMPLIFIER BIAS
	208116	426765- 12	INSULATOR - STEATITE, 0.38 DIA X 1.00 LG
	231037	8544755- 1	LENS FOR RECESSED METERS
	235844	3467690-508	KNOB ASSEMBLY FOR S1
	235843	3467690-507	KNOB ASSEMBLY FOR S2
	235842	3467690-501	KNOB ASSEMBLY FOR S3
	210281	426767- 9	INSULATOR - STEATITE, 0.75 DIA X 1.50 LG
	97745	486041- 14	TERMINAL - STUD
			MI-27475-AL EXCITER-AURAL AND VISUAL
			CAPACITORS
C101	213948	737883-383	PAPER, .47 MF ±20%, 400 V
C102	39636	727856-131	MICA, 220 MMF ±10%, 500 V
C103	45362	882321- 1	VARIABLE, 6-140 MMF
C104	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C105	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C106	223283	8520687- 5	CERAMIC, 100 MMF ±5% 500 V
C107	99177	8825449- 1	FEED THRU, .001 MF 500 V
C108	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C109	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C110	226130	8520687- 6	CERAMIC, 33 MMF ±5% 500 V
C111	39650	727866-145	MICA, 820 MMF ±10%, 500 V
C112	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C113	99177	8825449- 1	FEED-THRU, .001 MF 500 V

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
C114	206225	90575-355	CERAMIC, 2 MMF ±1 MMF 500 V
C115	39638	727856-133	MICA, 270 MMF ±10%, 500 V
C116	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C117	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C118	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C119	78913	90575-225	CERAMIC, 47 MMF ±5%, 500 V
C120	64059	90575-232	91 MMF ±5%, 500 V
C121	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C122	45469	90575-333	CERAMIC, 100 MMF ±10%, 500 V
C123	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C124	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C125	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C126	90015	90575-221	CERAMIC, 33 MMF ±5%, 500 V
C127	211303	90575-228	CERAMIC, 62 MMF ±5%, 500 V
C128	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C129	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C130	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C131	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C132	43368	844546- 2	VARIABLE, 5-75 MMF
C133	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C134	77252	990167- 13	CERAMIC DISC, .001 MF 500 V
C135	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C136	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C137	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C138	52376	844546- 7	VARIABLE, 6-100 MMF
C139	39664	727866-159	MICA, 3300 MMF ±10%, 500 V
C140	43368	844546- 2	VARIABLE, 5-75 MMF
C141 TO C147	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C148	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C149	211268	737863- 83	PAPER, .47 MF ±20%, 100 V
C150	204067	737863-383	PAPER, .47 MF ±20%, 400 V
C151	204067	737863-383	PAPER, .47 MF ±20%, 400 V
C152	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C153	79991	90575-237	CERAMIC, 150 MMF ±5%, 500 V
C154	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C155	211268	737863- 83	PAPER, .47 MF ±20%, 100 V
C156	204067	737863-383	PAPER, .47 MF ±20%, 400 V
C157	204067	737863-383	PAPER, .47 MF ±20%, 400 V
C158	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C159	102072	90575-359	CERAMIC, 5 MMF ±1 MMF 500 V
C160	212547	90575-239	CERAMIC, 180 MMF ±5%, 500 V
C161	207770	737863-375	PAPER, .1 MF ±20%, 400 V
C162	207770	737863-375	PAPER, .1 MF ±20%, 400 V
C163	212547	90575-239	CERAMIC, 180 MMF ±5%, 500 V
C164	206225	90575-355	CERAMIC, 2 MMF ±1 MMF 500 V
C165	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C166	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C167	102072	90575-359	CERAMIC, 5 MMF ±5%, 500 V
C168	207770	737863-375	PAPER, .1 MF ±20%, 400 V
C169	93229	90575-229	CERAMIC, 68 MMF ±5%, 500 V
C170	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C171	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C172	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C173	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C174	207770	737863-375	PAPER, .1 MF ±20%, 400 V
C175	79991	90575-237	CERAMIC, 150 MMF ±5%, 500 V
C176	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C177	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C178	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C179	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C180	213643	737863-381	PAPER, .33 MF ±20%, 400 V
C181	39648	727868-243	MICA, 680 MMF ±5%, 500 V
C182	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C183	39656	727866-151	MICA, 1500 MMF ±10%, 500 V
C184	77531	90575-325	CERAMIC, 47 MMF ±10%, 500 V
C185	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C186	207770	737863-375	PAPER, .1 MF ±20%, 400 V
C187	32153	90575-240	CERAMIC, 200 MMF ±5%, 500 V

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
C188	206225	90575-355	CERAMIC, 2 MMF ±1 MMF 500 V
C189	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C190	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C191	57517	90575-215	CERAMIC, 18 MMF ±5%, 500 V
C192	207770	737863-375	PAPER, .1 MF ±20%, 500 V
C193	93229	90575-229	CERAMIC, 68 MMF ±5%, 500 V
C194	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C195	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C196	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C197	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C198	207770	737863-375	PAPER, .1 MF ±20%, 400 V
C199	79991	90575-237	CERAMIC, 150 MMF ±5%, 500 V
C200	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C201	211176	90575-351	CERAMIC, .5 MMF ±1 MMF 500 V
C202	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C203	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C204	213643	737863-381	PAPER, .33 MF ±20%, 400 V
C205	39648	727868-243	MICA, 680 MMF ±5%, 500 V
C206	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C207	39656	727866-151	MICA, 1500 MMF ±10%, 500 V
C208	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C209	211171	737883- 75	PAPER, .1 MF ±20%, 100 V
C210	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C211	211171	737883- 75	PAPER, .1 MF ±20%, 100 V
C212	211170	737883- 15	PAPER, .015 MF ±10%, 100 V
C213	211170	737883- 15	PAPER, .015 MF ±10%, 100 V
C214	211170	737883- 15	PAPER, .015 MF ±10%, 100 V
C215	211169	737863- 87	PAPER, 1.0 MF ±20%, 100 V
C216	99187	8817264- 3	VARIABLE, 2.9-35 MMF
C217	99187	8817264- 3	VARIABLE, 2.9-35 MMF
C218	79991	90575-337	CERAMIC, 150 MMF ±10%, 500 V
C219	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C220	77252	990167- 13	CERAMIC DISC, .001 MF 500 V
C221	79991	90575-337	CERAMIC, 150 MMF ±10%, 500 V
C222	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C223	77252	990167- 13	CERAMIC DISC, .001 MF 500 V
C224	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C225	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C226	75450	90575-223	CERAMIC, 39 MMF ±5%, 500 V
C227	211303	90575-228	CERAMIC, 62 MMF ±5%, 500 V
C228	211177	90575-353	CERAMIC, 1.0 MMF ±1 MMF 500 V
C229	45469	90575-333	CERAMIC, 100 MMF ±10%, 500 V
C230	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C231	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C232	45467	90575-226	CERAMIC, 51 MMF ±5%, 500 V
C233	64059	90575-232	CERAMIC, 91 MMF ±5%, 500 V
C234	45469	90575-333	CERAMIC, 100 MMF ±10%, 500 V
C235	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C236	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C237	75450	90575-223	CERAMIC, 39 MMF ±5%, 500 V
C238	211303	90575-228	CERAMIC, 62 MMF ±5%, 500 V
C239	45469	90575-333	CERAMIC, 100 MMF ±10%, 500 V
C240	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C241	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C242	43368	844546- 2	VARIABLE, 5-75 MMF
C243	77252	990167- 13	CERAMIC DISC, .001 MF 500 V
C244	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C245	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C246	52376	844546- 7	VARIABLE, 6-100 MMF
C247	39664	727866-159	MICA, 3300 MMF ±10%, 500 V
C248	43368	844546- 2	VARIABLE, 5-75 MMF
C249	207145	459684- 35	FEED-THRU, .1 MF 400 V
C250 TO C260	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C261	212546	459684- 33	FEED-THRU, .01 MF 400 V
C262	211167	735712- 6	ELECT. 1500 MF 15 V
C263	211225	450184- 5	PAPER, 16 MF 400 V
C264	211225	450184- 5	PAPER, 16 MF 400 V

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
C265	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C266	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C267	45469	90575-333	CERAMIC, 100 MMF ±10%, 500 V
C268	75200	90575-311	CERAMIC, 12 MMF ±10%, 500 V
C269	75200	90575-311	CERAMIC, 12 MMF ±10%, 500 V
C270	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C271	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C272	99187	8817264- 3	VARIABLE, 2.9-35 MMF
C273	206225	90575-355	CERAMIC, 2 MMF ±1 MMF 500 V
C274	77531	90575-325	CERAMIC, 47 MMF ±10%, 500 V
C275	211169	737863- 87	PAPER, 1 MF ±20%, 100 V
C276	211171	737883- 75	PAPER, .1 MF ±20%, 100 V
C277	39662	727866-157	MICA, 2700 MMF ±10%, 500 V
C278	206480	737863-187	PAPER, 1 MF ±20%, 200 V
C279	211171	737883- 75	PAPER, .1 MF ±20%, 100 V
C280	211169	737863- 87	PAPER, 1 MF ±20%, 100 V
C281	210874	737883-183	PAPER, .47 MF ±20%, 200 V
C282	210874	737883-183	PAPER, .47 MF ±20%, 200 V
C283	210277	442901-158	ELECT. 20 MF 150 V
C284	211170	737883- 15	PAPER, .015 MF ±10%, 100 V
C285	211170	737883- 15	PAPER, .015 MF ±10%, 100 V
C286	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C287	98422	727856-223	MICA, 100 MMF ±5%, 500 V
C288	77865	90575-309	CERAMIC, 10 MMF ±1 MMF 500 V
C289	98422	727856-223	CERAMIC, 100 MMF ±5%, 500 V
C290			
TO			
C296	73960	990167- 19	CERAMIC DISC, .01 MF 500 V
C297	212547	90575-239	CERAMIC, 180 MMF ±5%, 500 V
C298	212547	90575-239	CERAMIC, 180 MMF ±5%, 500 V
C299	32153	90575-240	CERAMIC, 200 MMF ±5%, 500 V
C1001	230679	8519908- 4	VARIABLE, 8-50 MMF
C1002	230679	8519908- 4	VARIABLE, 8-50 MMF
CR101	59395	8985543- 1	CRYSTAL - DIODE, FREQ. DET.
CR102	59395	8985543- 1	CRYSTAL - DIODE, FREQ. DET.
CR103	211243	8908824- 6	RECTIFIER - FILAMENT
CR104	210347	8908824- 4	RECTIFIER - PLATE
CR105	59395	8985543- 1	CRYSTAL - DIODE
CR106	59395	8985543- 1	CRYSTAL - DIODE
F101	212327	8858508- 6	FUSE - CRYSTAL HEATER 1/2 AMP
F102	212327	8858508- 6	FUSE - CRYSTAL HEATER 1/2 AMP
I101	101857	872291- 9	LAMP - INDICATOR NE-51
I102	101857	872291- 9	LAMP - INDICATOR NE-51
I103	101857	872291- 9	LAMP - INDICATOR NE-51
I104	101857	872291- 9	LAMP - INDICATOR NE-51
J101	92180	433647- 1	RECEPTACLE - AURAL OUTPUT
J102	92180	433647- 1	RECEPTACLE - VISUAL OUTPUT
J103	55998	727969- 17	CONNECTOR - MALE, 12 CONTACT
J104	54472	889482- 3	RECEPTACLE - CRYSTAL HEATER SUPPLY
J105			
TO			
J114	205675	8825493- 3	CONNECTOR - TIP JACK
J115	211510	481799- 2	CONNECTOR - AUDIO INPUT
K101	211165	8917217- 1	RELAY - VISUAL CRYSTAL OSC. SELECTOR
K102	94846	8836934- 1	RELAY - OFF FREQ. INTERLOCK
L101	44679	862943- 1	CHOKE - 2.5 MH
L102	44679	862943- 1	CHOKE - 2.5 MH
L103	211238	481715- 4	COIL -
L104	211239	481715- 5	COIL -
L105			COIL - (PART OF F.D. KIT)
L106	57259	8898641- 3	CHOKE -
L107			COIL - (PART OF F.D. KIT)
L108	57259	8898641- 3	CHOKE
L109	211235	481715- 1	COIL -
L110	211236	481715- 2	COIL -
L111	211236	481715- 2	COIL -
L112	211236	481715- 2	COIL -
L113	211179	8825473-523	CHOKE
L114	98484	8886161- 11	CHOKE
L115	98484	8886161- 11	CHOKE

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
L116	202989	8825473-509	CHOKE
L117	202989	8825473-509	CHOKE
L118	211237	481715- 3	COIL -
L119	211238	481715- 4	COIL
L120	211239	481715- 5	COIL
L121			COIL - (PART OF F.D. KIT)
L122	57259	8898641- 3	CHOKE
L123			COIL - (PART OF F.D. KIT)
L124	57259	8898641- 3	CHOKE
L125	210703	476473- 1	REACTOR - .1 H D.C. FILAMENT
L126	210637	476457- 1	REACTOR - 5 H PLATE SUPPLY
L127	210637	476457- 1	REACTOR - 5 H PLATE SUPPLY
L128	211164	8917198- 1	CHOKE - .8 H
L129	98484	8886161- 11	CHOKE - .5 MH
L130	44679	862943- 1	CHOKE - 2.5 MH
L131	203721	867442- 5	CHOKE - 2.5 MH
M101	235469	993103- 3	METER
P101			PLUG - TYPE N, AURAL OUTPUT
P102			PLUG - TYPE N, VISUAL OUTPUT
P103			CONNECTOR - FEMALE, 12 CONTACT
P104	32661	878243- 1	CONNECTOR - CRYSTAL HEATER SUPPLY
P115	211509	481799- 1	CONNECTOR - AUDIO INPUT, MALE, 2 CONTACT
			RESISTOR - FIXED COMPOSITION, UNLESS NOTED
R101	502315	82283- 76	15,000 OHM ±10%, 1/2 W
R102	502222	82283- 66	2200 OHM ±10%, 1/2 W
R103	502222	82283- 66	2200 OHM ±10%, 1/2 W
R104	502315	82283- 76	15,000 OHM ±10%, 1/2 W
R105	502227	82283-169	2700 OHM ±5%, 1/2 W
R106	502227	82283-169	2700 OHM ±5%, 1/2 W
R107	522212	99126- 63	1200 OHM ±10%, 2 W
R108	512133	90496- 56	330 OHM ±10%, 1 W
R109	512318	90496- 77	18,000 OHM ±10%, 1 W
R110	512410	90496- 86	100,000 OHM ±10%, 1 W
R111	512382	90496- 85	82,000 OHM ±10%, 1 W
R112	522127	99126- 55	270 OHM ±10%, 2 W
R113	55186	867970-305	W.W. .43 OHM ±10%, 1/2 W
R114	512315	90496- 76	15,000 OHM ±10%, 1 W
R115	512368	90496- 84	68,000 OHM ±10%, 1 W
R116	502215	82283-163	1500 OHM ±5%, 1/2 W
R117	522127	99126- 55	270 OHM ±10%, 2 W
R118	512315	90496- 76	15,000 OHM ±10%, 1 W
R119	512368	90496- 84	68,000 OHM ±10%, 1 W
R120	502215	82283-163	1500 OHM ±5%, 1/2 W
R121	56596	458575-108	VARIABLE, 2500 OHM ±10%, 2 W
R122	522127	99126- 55	270 OHM ±10%, 2 W
R123	512315	90496- 76	15,000 OHM ±10%, 1 W
R124	512327	90496- 79	27,000 OHM ±10%, 1 W
R125	502210	82283-159	1000 OHM ±5%, 1/2 W
R126	512118	90496- 53	180 OHM ±10%, 1 W
R127	512110	90496-135	100 OHM ±5%, 1 W
R128	512310	90496- 74	10,000 OHM ±10%, 1 W
R129	512347	90496- 82	47,000 OHM ±10%, 1 W
R130	512347	90496- 82	47,000 OHM ±10%, 1 W
R131	512127	90496- 55	270 OHM ±10%, 1 W
R132	512339	90496- 81	39,000 OHM ±10%, 1 W
R133	512339	90496- 81	39,000 OHM ±10%, 1 W
R134	512312	90496- 75	12,000 OHM ±10%, 1 W
R135	512347	90496- 82	47,000 OHM ±10%, 1 W
R136	512347	90496- 82	47,000 OHM ±10%, 1 W
R137	512127	90496- 55	270 OHM ±10%, 1 W
R138	512339	90496- 81	39,000 OHM ±10%, 1 W
R139	512347	90496- 82	47,000 OHM ±10%, 1 W
R140	512127	90496- 55	270 OHM ±10%, 1 W
R141	512347	90496- 82	47,000 OHM ±10%, 1 W
R142	502210	82283- 62	1000 OHM ±10%, 1/2 W
R143	522282	99126- 73	8200 OHM ±10%, 2 W
R144	502222	82283- 66	2200 OHM ±10%, 1/2 W
R145	522282	99126- 73	8200 OHM ±10%, 2 W

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
R146	502222	82283- 66	2200 OHM ±10%, 1/2 W
R147	522282	99126- 73	8200 OHM ±10%, 2 W
R148	512347	90496- 82	47,000 OHM ±10%, 1 W
R149	512368	90496- 84	68,000 OHM ±10%, 1 W
R150	512322	90496- 78	22,000 OHM ±10%, 1 W
R151	512322	90496- 78	22,000 OHM ±10%, 1 W
R152	502210	82283- 62	1000 OHM ±10%, 1/2 W
R153	522282	99126- 73	8200 OHM ±10%, 2 W
R154	502222	82283- 66	2200 OHM ±10%, 1/2 W
R155	522282	99126- 73	8200 OHM ±10%, 2 W
R156	502222	82283- 66	2200 OHM ±10%, 1/2 W
R157	522282	99126- 73	8200 OHM ±10%, 2 W
R158	512347	90496- 82	47,000 OHM ±10%, 1 W
R159	502110	82283- 50	100 OHM ±10%, 1/2 W
R160	502410	82283- 86	100,000 OHM ±10%, 1/2 W
R161	512156	90496- 59	560 OHM ±10%, 1 W
R162	512110	90496- 50	100 OHM ±10%, 1 W
R163	512110	90496- 50	100 OHM ±10%, 1 W
R164	522247	99126- 70	4700 OHM ±10%, 2 W
R165	522347	99126- 82	47,000 OHM ±10%, 2 W
R166	502110	82283- 50	100 OHM ±10%, 1/2 W
R167	502410	82283- 86	100,000 OHM ±10%, 1/2 W
R168	512156	90496- 59	560 OHM ±10%, 1 W
R169	502610	82283- 74	10,000 OHM ±10%, 1/2 W
R170	502310	82283- 74	10,000 OHM ±10%, 1/2 W
R171	502510	82283- 98	1 MEGOHM ±10%, 1/2 W
R172	502410	82283- 86	100,000 OHM ±10%, 1/2 W
R173	512115	90496- 52	150 OHM ±10%, 1 W
R174	512322	90496- 78	22,000 OHM ±10%, 1 W
R175	512347	90496- 82	47,000 OHM ±10%, 1 W
R176	512212	90496- 63	1200 OHM ±10%, 1 W
R177	502410	82283- 86	100,000 OHM ±10%, 1/2 W
R178	512115	90496- 52	150 OHM ±10%, 1 W
R179	512322	90496- 78	22,000 OHM ±10%, 1 W
R180	512347	90496- 82	47,000 OHM ±10%, 1 W
R181	512212	90496- 63	1200 OHM ±10%, 1 W
R182	512410	90496- 86	100,000 OHM ±10%, 1 W
R183	522127	99126- 55	270 OHM ±10%, 2 W
R184	512315	90496- 76	15,000 OHM ±10%, 1 W
R185	512382	90496- 85	82,000 OHM ±10%, 1 W
R186	502215	82283-163	1500 OHM ±5%, 1/2 W
R187	522127	99126- 55	270 OHM ±10%, 2 W
R188	512315	90496- 76	15,000 OHM ±10%, 1 W
R189	512368	90496- 84	68,000 OHM ±10%, 1 W
R190	502215	82283-163	1500 OHM ±5%, 1/2 W
R191	522127	99126- 55	270 OHM ±10%, 2 W
R192	512315	90496- 76	15,000 OHM ±10%, 1 W
R193	512368	90496- 84	68,000 OHM ±10%, 1 W
R194	502215	82283-163	1500 OHM ±5%, 1/2 W
R195	522127	99126- 55	270 OHM ±10%, 2 W
R196	512315	90496- 76	15,000 OHM ±10%, 1 W
R197	512327	90496- 79	27,000 OHM ±10%, 1 W
R198	502210	82283-159	1000 OHM ±5%, 1/2 W
R199	512118	90496- 53	180 OHM ±10%, 1 W
R200	512110	90496-135	100 OHM ±5%, 1 W
R201	512310	90496- 74	10,000 OHM ±10%, 1 W
R202	211173	8857185- 24	W.W. 1350 OHM ±5%, 50 W
R203	512110	90496- 50	100 OHMS ±10% 1 W
R204	209649	990185-501	FILM, 100,000 OHM ±1%, 1/2 W
R205	209649	990185-501	FILM, 100,000 OHM ±1%, 1/2 W
R206	512368	90496- 84	68,000 OHM ±10%, 1 W
R207	512347	90496- 82	47,000 OHM ±10%, 1 W
R208	522247	99126- 70	4700 OHM ±10%, 2 W
R209	502347	82283- 82	47,000 OHM ±10%, 1/2 W
R210	502347	82283- 82	47,000 OHM ±10%, 1/2 W
R211	512182	90496- 61	820 OHM ±10%, 1 W
R212	512339	90496- 81	39,000 OHM ±10%, 1 W
R213	522322	99126- 78	22,000 OHM ±10%, 2 W
R214	502468	82283- 96	680,000 OHM ±10%, 1/2 W
R215	502410	82283- 86	100,000 OHM ±10%, 1/2 W

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
R216	512410	90496- 86	100,000 OHM ±10%, 1 W
R217	502118	82283-141	180 OHM ±5%, 1/2 W
R218	502118	82283-141	180 OHM ±5%, 1/2 W
R219	502118	82283-141	180 OHM ±5%, 1/2 W
R220	502118	82283-141	180 OHM ±5%, 1/2 W
R221	502133	82283-147	330 OHM ±5%, 1/2 W
R222	502082	82283-133	82 OHM ±5%, 1/2 W
R223	502082	82283-133	82 OHM ±5%, 1/2 W
R224	512382	90496- 85	82,000 OHM ±10%, 1 W
R225	512382	90496- 85	82,000 OHM ±10%, 1 W
S101	211241	480092- 1	SWITCH - ROTARY, METER SELECTOR, 2 SEC. 11 POSITION
S102	211166	8907253- 2	SWITCH - AFC OFF-ON SPST
S103	211242	8820446- 2	SWITCH - VIS. CRYSTAL OSC. SELECTOR
S104	211174	849370- 7	SWITCH - OVERLOAD, PLATE SUPPLY
T101	52685	902022- 1	TRANSFORMER - AUDIO INPUT
T102	211180	897903-502	TRANSFORMER - MOD. GRID PHASING
T103	223286	8618226-502	TRANSFORMER - FM OSC PLATE
T104	211182	728446- 13	TRANSFORMER - FIRST DIFF. FREQ. DIV.
T105	211183	728446- 14	TRANSFORMER - SECOND DIFF. FREQ. DIV.
T106	211184	728446- 15	TRANSFORMER - THIRD DIFF. FREQ. DIV.
T107	211184	728446- 15	TRANSFORMER - CATH. FOLL. INPUT
T108	211182	728446- 13	TRANSFORMER - FIRST REF. FREQ. DIV.
T109	211183	728446- 14	TRANSFORMER - SECOND REF. FREQ. DIV.
T110	211184	728446- 15	TRANSFORMER - THIRD REF. FREQ. DIV.
T111	211184	728446- 15	TRANSFORMER - CATH. FOLL. INPUT
T112	51734	442511- 1	TRANSFORMER - FREQ. DET. INPUT
T113	51734	442511- 1	TRANSFORMER - FREQ. DET. INPUT
T114	210635	474849- 1	TRANSFORMER - FILAMENT
T115	210636	476456- 1	TRANSFORMER - PLATE
T116	210660	481743- 1	TRANSFORMER - OFF-FREQ. INTERLOCK CONTROL PLATE AND BIAS
XC262	207594	99100- 7	SOCKET - OCTAL
XCR101	95470	8837869- 1	HOLDER - CRYSTAL
XCR102	95470	8837869- 1	HOLDER - CRYSTAL
XF101	48894	99088- 2	FUSE - HOLDER
XF102	48894	99088- 2	FUSE - HOLDER
XI101		8856946- 2	SOCKET - LAMP
XI102		8856946- 2	SOCKET - LAMP
XI103		8856946- 2	SOCKET - LAMP
XI104		8856946- 2	SOCKET - LAMP
	208080		JEWEL ONLY
	56610		SOCKET ONLY
XV101	68590	99100- 5	SOCKET - TUBE, OCTAL
XV102	68590	99100- 5	SOCKET - TUBE, OCTAL
XV103	68590	99100- 5	SOCKET - TUBE, OCTAL
XV104	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV105	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV106	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV107	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV108	94879	737867- 18	SOCKET - TUBE, 7 PIN
XV109	94879	737867- 18	SOCKET - TUBE, 7 PIN
XV110	94879	737867- 18	SOCKET - TUBE, 7 PIN
XV111	68590	99100- 5	SOCKET - TUBE, OCTAL
XV112	68590	99100- 5	SOCKET - TUBE, OCTAL
XV113	68590	99100- 5	SOCKET - TUBE, OCTAL
XV114	94879	737867- 18	SOCKET - TUBE, 7 PIN
XV115	68590	99100- 5	SOCKET - TUBE, OCTAL
XV116	68590	99100- 5	SOCKET - TUBE, OCTAL
XV117	68590	99100- 5	SOCKET - TUBE, OCTAL
XV118	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV119	98487	742413- 2	SOCKET - TUBE, VECTOR 7 PIN
XV120	98487	742413- 2	SOCKET - TUBE, VECTOR 7 PIN
XV121	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV122	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV123	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV124	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV125	94880	737870- 18	SOCKET - TUBE, 9 PIN
XV126	68950	99100- 5	SOCKET - TUBE, OCTAL
XV127	98487	742413- 2	SOCKET - TUBE, VECTOR 7 PIN

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
XV128	94879	737867- 18	SOCKET - TUBE, 7 PIN
XY101	75061	746002- 7	SOCKET - CRYSTAL, 9 PIN
XY102	75061	746002- 7	SOCKET - CRYSTAL, 9 PIN
XY103	211175	8885952- 3	SOCKET - CRYSTAL, 2 PIN
XZ101	210892	746048- 4	SOCKET - PRE EMPHASIS NETWORK, OCTAL
Y103	211382	8918026- 1	CRYSTAL UNIT, 1500 KC
Z101	219730	481755- 3	NETWORK - PRE-EMPHASIS
			MISCELLANEOUS
	211248	8817922- 1	DIAL - INDICATOR, ROUND, 0 TO 10
	211244	8917263- 1	DRIVE UNIT - FOR 2C103
	211247	426764- 3	INSULATOR - STEAT., 0.50 DIA X 0.62 LG
	211246	426764- 53	INSULATOR - STEAT., 0.50 DIA X 0.38 LG
	57692	8896313- 1	MOUNT - SHOCK
	53016	99147- 1	SHIELD - TUBE, (6AS6,6AK5)
	54521	99147- 2	SHIELD - TUBE, (2D21, 6J6)
	210897	99147- 3	SHIELD - TUBE, (6AQ5)
	56359	8888549- 2	SHIELD - TUBE, (12AT7)
	215853	483884- 12	SHIELD - TUBE, (5763)
	205544	8845693- 2	CONNECTOR - COAXIAL CABLE SHIELD
	210376	426766- 8	INSULATOR - STEAT., 1 IN LG X 1/2 IN DIA
	232485	1510922-108	KNOB FOR S101
			MI-34471-A MODULATOR
B301	225127	8465179- 2	MOTOR -VIDEO GAIN CONTROL (INCLUDES R301 AND R443)
B302	225126	8465179- 4	MOTOR - PEDESTAL LEVEL CONTROL (INCLUDES R488)
			CAPACITORS
C301	217061	990421-106	PAPER, 0.47 MF ±10%, 100 V
C302	106943	993026-453	MICA, 470 MMF ±5%, 500 V
C303	225128	8741453- 11	PAPER, 10 MF ±10%, 200 V
C304	209079	990421-155	PAPER, 0.22 MF ±10% 400 V
C305	225129	990195- 84	PAPER, 10 MF ±10%, 400 V
C306	225130	990419-163	PAPER, 0.0022 MF ±10%, 600 V
C307	225128	8741453- 11	PAPER, 10 MF ±10%, 200 V
C308	208788	990421-151	PAPER, 0.047 MF ±10% 400 V
C309	225129	990195- 84	PAPER, 10 MF ±10%, 400 V
C312	206467	737883-505	PAPER, 0.0022 MF ±10%, 1000 V
C313	225129	990195- 84	PAPER, 10 MF ±10%, 200 V
C314	94337	8946094- 4	ELECT. 500 MF 6 V
C315	225131	990437-375	PAPER, 0.22 MF ±10%, 600 V
C316	225131	990437-375	PAPER, 0.22 MF ±10%, 600 V
C317	225132	990437-377	PAPER, 0.47 MF ±10%, 600 V
C318	225132	990437-377	PAPER, 0.47 MF ±10%, 600 V
C319	56690	984003- 10	VARIABLE, 1.5 TO 7 MMF
C320		449696- 54	CERAMIC, 4700 MMF 500 V
C321	225129	990195- 84	PAPER, 10 MF ±10%, 400 V
C322	225129	990195- 84	PAPER, 10 MF ±10%, 400 V
C323	73473	449696- 54	CERAMIC, 4700 MMF 500 V
C324	73473	449696- 54	CERAMIC, 4700 MMF 500 V
C325	73473	449696- 54	CERAMIC, 4700 MMF 500 V
C329	73473	449696- 54	CERAMIC, 4700 MMF 500 V
C330	73473	449696- 54	CERAMIC, 4700 MMF 500 V
C331	73473	449696- 54	CERAMIC, 4700 MMF 500 V
C332	73473	449696- 54	CERAMIC, 4700 MMF 500 V
C333	96565	449619- 17	ELECT. 10/10/10 MF 450 V
C334	225131	990437-375	PAPER, 0.22 MF ±10%, 600 V
C335	225131	990437-375	PAPER, 0.22 MF ±10%, 600 V
C336	225131	990437-375	PAPER, 0.22 MF ±10%, 600 V
C337	225131	990437-375	PAPER, 0.22 MF ±10%, 600 V
C338	225129	990195- 84	PAPER, 10 MF ±10%, 400 V
C339	225129	990195- 84	PAPER, 10 MF ±10%, 400 V
C340	210909	990421-153	PAPER, 0.1 MF ±10%, 400 V

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
C341	210909	990421-153	PAPER, 0.1 MF ±10%, 400 V
C342	225133	990437-328	PAPER, 0.47 MF ±10%, 200 V
C343	610003	36655-503	MICA, .01 MF METER BYPASS
C344	204812	8519908- 1	VARIABLE, 1.5 TO 7 MMF
C345	230675	990421-106	PAPER, 0.47 MF ±10% 100 V
C346	96618	449619- 19	ELECT. 80 MF 450 V
C347	208788	990421-151	PAPER, 0.047 MF ±10%, 400 V
C348	210496	990437-255	PAPER, 0.22 MF ±20%, 400 V
C349	207085	990419-193	PAPER, 0.1 MF ±10%, 1000 V
C350	211741	990421- 31	PAPER, 1.0 MF ±20%, 200 V
C351	300188	993026-447	MICA, 270 MF ±5% 500 V
C354	209079	990421-127	PAPER, 0.22 MF ±10%, 200 V
C355	225128	8741453- 11	PAPER, 10 MF ±10%, 200 V
C356	300185	993026-241	MICA, 150 MMF ±10% 500 V
C357	210909	990421-153	PAPER, 0.1 MF ±10%, 400 V
C359	225135	990437-324	PAPER, 0.1 MF ±10%, 200 V
C360	225128	8741453- 11	PAPER, 10 MF ±10%, 200 V
C361	209079	990421-155	PAPER, 0.22 MF ±10%, 400 V
C362		993026-441	MICA, 150 MMF ±5%, 500 V
C363	225128	8741453- 11	PAPER, 10 MF ±10%, 200 V
C364	208788	990421-151	PAPER, 0.047 MF ±10%, 400 V
C365	225128	8741453- 11	PAPER, 10 MF ±10%, 200 V
C366	225136	990421-147	PAPER, 0.01 MF ±10%, 400 V
C367	225136	990421-147	PAPER, 0.01 MF ±10%, 400 V
C368	210909	990421-153	PAPER, 0.1 MF ±10%, 400 V
C369	210909	990421-153	PAPER, 0.1 MF ±10%, 400 V
C370	210875	990419-151	PAPER, 0.047 MF ±10%, 400 V
C371	210875	990419-151	PAPER, 0.047 MF ±10%, 400 V
C372	225137	990419-191	PAPER, 0.047 MF ±10%, 1000 V
C373	225137	990419-191	PAPER, 0.047 MF ±10%, 1000 V
C374	225128	8741453- 11	PAPER, 10 MF ±10%, 200 V
C375	225134	990437-330	PAPER, 1.0 MF ±10%, 200 V
C376	77688	993013-308	CERAMIC, 5 MMF ±1% 500 V
C377	78262	993013-310	CERAMIC, 7 MMF ±1% 500 V
C379	225134	990437-330	PAPER, 1.0 MF ±10%, 200 V
C380	211560	990421-159	PAPER, 1.0 MF ±10%, 400 V
C381	207085	990419-193	PAPER, 0.1 MF ±10%, 1000 V
C382	225128	8741453- 11	PAPER, 10 MF ±10%, 200 V
C383	225129	990195- 84	PAPER, 10 MF ±10%, 400 V
C384	225131	990437-275	PAPER, 0.22 MF ±20%, 600 V
C385	226113	990421-159	PAPER, 1.0 MF ±10%, 400 V
C386	225138	990437-378	PAPER, 0.68 MF ±10%, 600 V
C387	225139	990195- 29	PAPER, 10 MF ±10%, 1000 V
C388	236324	990195- 10	PAPER, 15 MF ±10% 600 V
C389	610003	36655-503	MICA, .01 MF METER BYPASS
C390	230679	8519908- 4	VARIABLE, 8.0 TO 50 MMF 350 V
C391	230679	8519908- 4	VARIABLE, 8.0 TO 50 MMF 350 V
C392	230679	8519908- 4	VARIABLE, 8.0 TO 50 MMF 350 V
C393	230679	8519908- 4	VARIABLE, 8.0 TO 50 MMF 350 V
C394	225140	990437-326	PAPER, 0.22 MF ±20%, 200 V
C395	225140	990437-326	PAPER, 0.22 MF ±20%, 200 V
C396	225140	990437-326	PAPER, 0.22 MF ±20%, 200 V
C397	225140	990437-326	PAPER, 0.22 MF ±20%, 200 V
C398	56232	8519908- 4	VARIABLE, 8.0 TO 50 MMF
C399	205656	1510003- 37	CERAMIC, 0.01 MF 500 V
C402	230015	993026-422	MICA, 24 MMF ±5% 500 V
CR301	257475		DIODE - TYPE 1N497
CR302	257475		DIODE - TYPE 1N497
CR303	257475		DIODE - TYPE 1N497
CR304	257475		DIODE - TYPE 1N497
CR305	257475		DIODE - TYPE 1N497
J301	51928	727969- 11	CONNECTOR - MALE
J302	55998	727969- 17	CONNECTOR - MALE
J303	51800	727215- 3	CONNECTOR - FEMALE, SINGLE CONTACT
J304			CONNECTOR - MOD. OUTPUT, (PART OF 8521300)
J305	51800	727215- 3	CONNECTOR - FEMALE, SINGLE CONTACT
J306			
TO			
J321	203532	8825493- 2	CONNECTOR - TIP JACK (RED)
K301	210888	8914882- 1	RELAY BIAS INTERLOCK

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
L301	213967	8829484-505	COIL ASSEMBLY - FIRST VIDEO SERIES PEAKING
L302	225141	8917178-501	COIL ASSEMBLY - HIGH PEAKER
L303	213967	8829484-505	COIL ASSEMBLY - FIRST VIDEO SHUNT PEAKING
L304	238402	8829484-507	COIL - PEAKING
L305	204402	8886161- 9	CHOKE - 1 MH
L306	207093	8829484-504	COIL ASSEMBLY - LIN. CORR. SHUNT PEAKING
L307	97399	8829484-501	COIL ASSEMBLY - SECOND VIDEO SERIES PEAKING
L308	227953	476933- 8	COIL ASSEMBLY - SECOND VIDEO SHUNT PEAKING
L309	204402	8886161- 9	CHOKE - 1 MH
L310	225143	8410939-503	COIL ASSEMBLY - THIRD VIDEO SERIES PEAKING
L311	225142	8410939-504	COIL ASSEMBLY - THIRD VIDEO SHUNT PEAKING
L312	204402	8886161- 9	CHOKE - 1 MH
L313	204402	8886161- 9	CHOKE - 1 MH
M301	235856	993104- 1	METER - 0-3/0-10 (0-1 MA)
M302	235995	993091- 67	METER - 0-500 MA
P301			CONNECTOR - FEMALE, (PART OF 8523338-501)
P302			CONNECTOR - (PART OF MI-34466)
P303	66344	252868- 1	CONNECTOR - MALE, COAXIAL
P304			CONNECTOR - (PART OF 8521300)
P305	66344	252868- 1	CONNECTOR - MALE, COAXIAL
			RESISTOR - FIXED COMPOSITION, UNLESS NOTED
R301			200 OHMS 1/4 W (PART OF B301)
R302	208958	458575-101	VARIABLE, 50 OHM ±10%, 2 W
R303	512118	90496-141	180 OHM ±5%, 1 W
R304	512122	90496-143	220 OHM ±5%, 1 W
R305	502033	82283- 44	33 OHM ±10%, 1/2 W
R306	502439	82283-221	390,000 OHM ±5%, 1/2 W
R307	502047	82283- 46	47 OHM ±10%, 1/2 W
R309	512110	90496-135	100 OHM ±5%, 1 W
R310	98221	458575-105	VARIABLE, 500 OHM ±10%, 2 W
R311	502047	82283- 46	47 OHM ±10%, 1/2 W
R312	502310	82283-183	10,000 OHM ±5%, 1/2 W
R313	512227	90496- 67	2700 OHM ±10%, 1 W
R314	522147	99126-151	470 OHM ±5%, 2 W
R315	522147	99126-151	470 OHM ±5%, 2 W
R316	94886	99317- 3	5 OHM ±1%, 1 W
R317	502447	82283-223	470,000 OHM ±5%, 1/2 W
R318	502310	82283-183	10,000 OHM ±5%, 1/2 W
R319	512110	90496-135	100 OHM ±5%, 1 W
R320	512110	90496-135	100 OHM ±5%, 1 W
R321	512182	90496-157	820 OHM ±5%, 1 W
R322	94886	99317- 3	5 OHM ±1%, 1 W
R323	502227	82283-169	2700 OHM ±5%, 1/2 W
R324	502033	82283- 44	33 OHM ±10%, 1/2 W
R329	502047	82283- 46	47 OHM ±10%, 1/2 W
R330	502047	82283- 46	47 OHM ±10%, 1/2 W
R331	522168	99126-155	680 OHM ±5%, 2 W
R332	522168	99126-155	680 OHM ±5%, 2 W
R334	94886	99317- 3	5 OHM ±1%, 1 W
R336	502033	82283- 44	33 OHM ±10%, 1/2 W
R338	502033	82283- 44	33 OHM ±10%, 1/2 W
R340	502033	82283- 44	33 OHM ±10%, 1/2 W
R341	502447	82283- 94	470,000 OHM ±10%, 1/2 W
R343	512047	90496-127	47 OHM ±5%, 1 W
R344	502015	82283-115	15 OHM ±5%, 1/2 W
R347	502239	82283-173	3900 OHM ±5%, 1/2 W
R348	522162	99126-154	620 OHM ±5%, 2 W
R349	522210	99126-159	1000 OHM ±5%, 2 W
R350	522168	99126-155	680 OHM ±5%, 2 W
R354	94886	99317- 3	5 OHM ±1%, 1 W
R355	512247	90496-175	4700 OHM ±5%, 1 W
R356	502033	82283- 44	33 OHM ±10%, 1/2 W
R357	502033	82283- 44	33 OHM ±10%, 1/2 W
R360	502033	82283- 44	33 OHM ±10%, 1/2 W
R361	502033	82283- 44	33 OHM ±10%, 1/2 W
R362	512115	90496-139	150 OHMS ±5% 1 W
R363	512115	90496-139	150 OHMS ±5% 1 W
R364	210908	99317- 10	1.67 OHM ±1%, 1 W

Symbol	Stock No.	Drawing No.	Description
PREFIX 2			
R365	210908	99317- 10	1.67 OHM ±1%, 1 W
R366	512222	90496-167	2200 OHM ±5%, 1 W
R367	512156	90496-153	560 OHMS ±5% 1 W
R369	512010	90496- 38	10 OHM ±5%, 1 W
R370	97276	8857185- 18	7000 OHM ±5%, 50 W
R371	522218	99126-165	1800 OHM ±5%, 2 W
R372	206510	8888772- 28	4000 OHM ±5%, 115 W
R373	206510	8888772- 28	4000 OHM ±5%, 115 W
R374	502427	82283- 91	270,000 OHM ±10%, 1/2 W
R375	502427	82283- 91	270,000 OHM ±10%, 1/2 W
R379	207032	990187-501	100,000 OHM ±1%, 1 W
R380 TO R386	502033	82283- 44	33 OHM ±10%, 1/2 W
R387	512010	90496- 38	10 OHM ±10%, 1 W
R388	512010	90496- 38	10 OHM ±10%, 1 W
R389	512010	90496- 38	10 OHM ±10%, 1 W
R390			47 OHM (PART OF TUBE CAP)
R391			47 OHM (PART OF TUBE CAP)
R392			47 OHM (PART OF TUBE CAP)
R393			47 OHM (PART OF TUBE CAP)
R394 TO R400	502033	82283- 44	33 OHM ±10%, 1/2 W
R404	96543	8857185- 15	20,000 OHM ±5%, 25 W
R405	96543	8857185- 15	20,000 OHM ±5%, 25 W
R406	96543	8857185- 15	20,000 OHM ±5%, 25 W
R407	206511	8857185- 22	10,000 OHM ±5%, 50 W
R408	206511	8857185- 22	10,000 OHM ±5%, 50 W
R409	512110	90496- 50	100 OHM ±10%, 1 W
R410	512110	90496- 50	100 OHM ±10%, 1 W
R411	512110	90496- 50	100 OHM ±10%, 1 W
R412	512110	90496- 50	100 OHM ±10%, 1 W
R413	512110	90496- 50	100 OHM ±10%, 1 W
R414	210908	99317- 10	1.67 OHM ±1%, 1 W
R415	210908	99317- 10	1.67 OHM ±1%, 1 W
R416	210908	99317- 10	1.67 OHM ±1%, 1 W
R417	210908	99317- 10	1.67 OHM ±1%, 1 W
R418	512010	90496- 38	10 OHM ±10%, 1 W
R419	512010	90496- 38	10 OHM ±10%, 1 W
R420	236381	8917168- 3	180 OHMS ±5% 20 W
R421	207243A	990187-401	10,000 OHM ±1%, 1 W
R422	210886	990187-568	499,000 OHM ±1%, 1 W
R423	502310	82283-183	10,000 OHMS ±5% 1/2 W
R424	502510	82283- 98	1 MEG ±10%, 1/2 W
R425	502115	82283- 52	150 OHM ±10%, 1/2 W
R426	512110	90496- 50	100 OHM ±10%, 1 W
R427	522110	99126-135	100 OHMS ±5% 2 W
R428	207077	8817660- 26	150 OHM ±5%, 10 W
R429	53651	443853- 9	7500 OHM ±5%, 10 W
R430	512210	90496- 62	1000 OHM ±10%, 1 W
R431	512412	90496- 87	120,000 OHM ±10%, 1 W
R432	512422	90496- 90	220,000 OHM ±10%, 1 W
R433	502447	82283- 94	470,000 OHM ±10%, 1/2 W
R434	502147	82283- 58	470 OHM ±10%, 1/2 W
R435	512315	90496- 76	15,000 OHM ±10%, 1 W
R436	502210	82283- 62	1000 OHM ±10%, 1/2 W
R437	69297	993008- 93	4000 OHM ±5%, 10 W
R438	221952	993008-105	16,000 OHM ±5%, 10 W
R439	502447	82283- 94	470,000 OHM ±10%, 1/2 W
R440	502033	82283- 44	33 OHM ±10%, 1/2 W
R441	57188	443853- 56	3300 OHM ±5%, 5 W
R442	512110	90496- 50	100 OHM ±10%, 1 W
R443			RESISTOR - PART OF B301
R444	502210	82283- 62	1000 OHM ±10%, 1/2 W
R445	502447	82283- 94	470,000 OHM ±10%, 1/2 W
R446	502033	82283- 44	33 OHM ±10%, 1/2 W
R448	522215	99126- 64	1500 OHM ±10%, 2 W
R449	502210	82283- 62	1000 OHM ±10%, 1/2 W
R450	512010	90496- 38	10 OHM ±10%, 1 W

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
R453	512310	90496- 74	10,000 OHMS ±10% 1 W
R454	98446	891832- 56	75,000 OHM ±5%, 5 W
R455	68837	433196- 34	VARIABLE, 25,000 OHM ±10%, 2 W
R456	502415	82283- 88	150,000 OHM ±10%, 1/2 W
R457	512227	90496-169	2700 OHM ±5%, 1 W
R458	512310	90496- 74	10,000 OHM ±10%, 1 W
R459	502227	82283- 67	2700 OHM ±10%, 1/2 W
R460	502515	82283-100	1.5 MEG. OHM ±10%, 1/2 W
R461	59175	993007-108	22,000 OHM ±5%, 5 W
R462	512210	90496-159	1000 OHM ±5%, 1 W
R463	512247	90496-175	4700 OHM ±5%, 1 W
R464	512110	90496- 50	100 OHM ±10%, 1 W
R465	502410	82283- 86	100,000 OHM ±10%, 1/2 W
R466	210885	990187-366	4750 OHM ±1%, 1 W
R467	210885	990187-366	4750 OHM ±1%, 1 W
R468	512415	90496- 88	150,000 OHM ±10%, 1 W
R469	502210	82283- 62	1000 OHM ±10%, 1/2 W
R470	502410	82283- 86	100,000 OHM ±10%, 1/2 W
R471	210885	990187-366	4750 OHM ±1%, 1 W
R472	210885	990187-366	4750 OHM ±1%, 1 W
R473	512415	90496- 88	150,000 3HM ±10%, 1 W
R474	512356	90496- 83	56,000 OHM ±10%, 1 W
R475	215179	990185-501	100,000 OHM ±1%, 1/2 W
R479	215179	990185-501	100,000 OHM ±1%, 1/2 W
R480	502415	82283- 88	150,000 OHM ±10%, 1/2 W
R481	215179	990185-501	100,000 OHM ±1%, 1/2 W
R482	215179	990185-501	100,000 OHM ±1%, 1/2 W
R483	502415	82283- 88	150,000 OHM ±10%, 1/2 W
R484	512375	90496-204	75,000 OHM ±5%, 1 W
R485	512375	90496-204	75,000 OHM ±5%, 1 W
R486	502218	82283-165	1800 OHM ±5%, 1/2 W
R487	512347	90496- 82	47,000 OHM ±10%, 1 W
R488			RESISTOR - PART OF B302
R489	522391	99126-206	91,000 OHM ±5%, 2 W
R490	512110	90496- 50	100 OHM ±10%, 1 W
R491	512247	90496- 70	4700 OHM ±10%, 1 W
R492	95754	177757- 30	VARIABLE, 2000 OHM ±10%, 2 W
R493	512233	90496- 68	3300 OHM ±10%, 1 W
R494	512422	90496- 90	220,000 OHM ±10%, 1 W
R495	512422	90496- 90	220,000 OHM ±10%, 1 W
R496	512415	90496- 88	15,000 OHM ±10%, 1 W
R497	522010	99126-111	10 OHMS ±5% 2 W
R498	522010	99126-111	10 OHMS ±5% 2 W
R499	522010	99126-111	10 OHMS ±5% 2 W
R500	522010	99126-111	10 OHMS ±5% 2 W
R501	512410	90496- 86	100,000 OHM ±10%, 1 W
R504	210913	8857185- 28	1600 OHM ±5%, 25 W
R505	512110	90496- 50	100 OHM ±10%, 1 W
R506	502110	82283- 50	100 OHM ±10%, 1/2 W
R507	502110	82283- 50	100 OHM ±10%, 1/2 W
R508	502110	82283- 50	100 OHM ±10%, 1/2 W
R509	502110	82283- 50	100 OHM ±10%, 1/2 W
R510	210908	99317- 10	1.67 OHM ±1%, 1 W
R511	210908	99317- 10	1.67 OHM ±1%, 1 W
R512	210908	99317- 10	1.67 OHM ±1%, 1 W
R513	210908	99317- 10	1.67 OHM ±1%, 1 W
R514	512447	90496- 94	47,000 OHM ±10%, 1 W
R515	522322	99126- 78	22,000 OHM ±10%, 2 W
R516	59175	993007-108	22,000 OHM ±5%, 5 W
R517	512447	90496- 94	470,000 OHM ±10%, 1 W
R518	522318	99126- 77	18,000 OHM ±10%, 2 W
R519	93175	458575-110	VARIABLE, 10,000 OHM ±10%, 2 W
R520	55594	993007-103	12,000 OHM ±5%, 5 W
R521	502410	90496- 86	100,000 OHM ±10%, 1 W
R522	522410	99126-207	100,000 OHM ±5%, 2 W
R523	225144	99317- 14	0.5 OHM ±1%, 1 W
R524	225144	99317- 14	0.5 OHM ±1%, 1 W
R525	225144	99317- 14	0.5 OHM ±1%, 1 W
R529	225144	99317- 14	0.5 OHM ±1%, 1 W
R530	502110	82283- 50	100 OHM ±10%, 1/2 W

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
R531	502110	82283- 50	100 OHM ±10%, 1/2 W
R532	502110	82283- 50	100 OHM ±10%, 1/2 W
R533	502110	82283- 50	100 OHM ±10%, 1/2 W
R534	55052	993007- 47	20 OHM ±10%, 5 W
R535	55052	993007- 47	20 OHM ±10%, 5 W
R536	55052	993007- 47	20 OHM ±10%, 5 W
R537	55052	993007- 47	20 OHM ±10%, 5 W
R538	512368	90496- 84	68,000 OHM ±10%, 1 W
R539	44963	993008-113	40,000 OHM ±5%, 10 W
R540	512510	90496- 98	1 MEG OHM ±10%, 1 W
R541	512510	90496- 98	1 MEG OHM ±10%, 1 W
R542	57402	458575-116	VARIABLE, 250,000 OHM ±10%, 2 W
R543	512433	90496- 92	330,000 OHM ±10%, 1 W
R544	512312	90496- 75	12,000 OHM ±10%, 1 W
R545	225145	993007- 19	0.8 OHM ±10%, 5 W
R546	210884	990187-263	442 OHM ±1%, 1 W
R547	212130	990187-547	301,000 OHM ±1%, 1 W
R548	56329	990187-601	1 MEG OHM ±1%, 1 W
R549	512210	90496-159	1000 OHM ±5%, 1 W
R550	512210	90496-159	1000 OHM ±5%, 1 W
R551	512222	90496-167	2200 OHM ±5%, 1 W
R552	512233	90496-171	3300 OHM ±5%, 1 W
R553	512168	90496-155	680 OHM ±5%, 1 W
R554	204920	993007-109	25,000 OHM ±5%, 5 W
R555	204920	993007-109	25,000 OHM ±5%, 5 W
R556	204920	993007-109	25,000 OHM ±5%, 5 W
R557	204920	993007-109	25,000 OHM ±5%, 5 W
R558	98956	458575-106	VARIABLE, 1000 OHM ±10%, 2 W
R559	98956	458575-106	VARIABLE, 1000 OHM ±10%, 2 W
R560	98956	458575-106	VARIABLE, 1000 OHM ±10%, 2 W
R561	98956	458575-106	VARIABLE, 1000 OHM ±10%, 2 W
R562	522433	99126-219	330,000 OHM ±5%, 2 W
R563	522433	99126-219	330,000 OHM ±5%, 2 W
R564	512210	90496-159	1000 OHM ±5%, 1 W
S301	225146	8465631- 1	SWITCH - DC METER
S302	225146	8465631- 1	SWITCH - REG. METER
S303	225147	461464- 3	SWITCH - COUPLING, AC-DC
S304	46760	861109- 1	SWITCH - LINEARITY CORRECTOR, OFF-ON
T301	225148	8465625- 1	TRANSFORMER - FILAMENT
T302	225149	8465626- 1	TRANSFORMER - FILAMENT
T303	225150	8463967- 1	TRANSFORMER - FILAMENT
XC333	207594	99100- 7	SOCKET - OCTAL RED
XC346	207594	99100- 7	SOCKET - OCTAL RED
XCR301	218920	8980029-501	HOLDER - CRYSTAL
XCR302	218920	8980029-501	HOLDER - CRYSTAL
XCR303	218920	8980029-501	HOLDER - CRYSTAL
XCR304	218920	8980029-501	HOLDER - CRYSTAL
XCR305	218920	8980029-501	HOLDER - CRYSTAL
XK301	208505	99393- 1	SOCKET - RELAY, 8 PIN
XV301	210918	742413- 8	SOCKET - TUBE, 9 PIN
XV302	210918	742413- 8	SOCKET - TUBE, 9 PIN
XV304	210918	742413- 8	SOCKET - TUBE, 9 PIN
XV305	204172	746002- 2	SOCKET - TUBE, 5 PIN
XV306	204172	746002- 2	SOCKET - TUBE, 5 PIN
XV307	94925	8436746- 7	SOCKET - TUBE, 7 PIN
XV308	210892	746048- 6	SOCKET - TUBE, OCTAL
XV309	210892	746048- 4	SOCKET - TUBE, OCTAL
XV310	210892	746048- 4	SOCKET - TUBE, OCTAL
XV311	210893	746048- 6	SOCKET - TUBE, OCTAL
XV312	210893	746048- 6	SOCKET - TUBE, OCTAL
XV313	210893	746048- 6	SOCKET - TUBE, OCTAL
XV314	210893	746048- 6	SOCKET - TUBE, OCTAL
XV315	94926	737870- 14	SOCKET - TUBE, 9 PIN
XV316 TO XV325	94925	8436746- 7	SOCKET - TUBE, 7 PIN
XV326	210918	742413- 8	SOCKET - TUBE, 9 PIN
XV327	210918	742413- 8	SOCKET - TUBE, 9 PIN
XV328	210918	742413- 8	SOCKET - TUBE, 9 PIN
XV329	210918	742413- 8	SOCKET - TUBE, 9 PIN

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
XV330	210918	742413- 8	SOCKET - TUBE, 9 PIN
XV331	210894	742413- 7	SOCKET - TUBE, 7 PIN
XV332	210894	742413- 7	SOCKET - TUBE, 7 PIN
XV333	210892	746048- 4	SOCKET - TUBE, OCTAL
XV334	210892	746048- 4	SOCKET - TUBE, OCTAL
XV335	210892	746048- 4	SOCKET - TUBE, OCTAL
XV336	210892	746048- 4	SOCKET - TUBE, OCTAL
XV337	94925	8436746- 7	SOCKET - TUBE, 7 PIN
XV338	210645	746048- 5	SOCKET - TUBE, OCTAL
XV339	210645	746048- 5	SOCKET - TUBE, OCTAL
XV340	210892	746048- 4	SOCKET - TUBE, OCTAL
XV341	94925	8436746- 7	SOCKET - TUBE, 7 PIN
XV342	68590	99100- 5	SOCKET - TUBE, OCTAL
XV343	68590	99100- 5	SOCKET - TUBE, OCTAL
XV344	210892	746048- 4	SOCKET - TUBE, OCTAL
			MISCELLANEOUS
	97821	486041- 10	TERMINAL - INSULATED STAND-OFF, 0.234 IN. DIA. X 57/64 IN. LG.
	224796	486041- 4	TERMINAL - INSULATED STAND-OFF, 15/64 IN. DIA. X 5/8 IN. LG.
	52717	7862770- 1	CLIP - FUSE CLIP FOR R372 AND R373
	210084	426773- 3	INSULATOR - STEAT., 3/4 IN SQ. X 1 IN LG
	99050	8815313- 1	CAP - TUBE, MOLDED, 3/8 IN DIA (INCLUDES 47 OHM RESISTOR)
	207701	8902006-501	CAP - TUBE, CERAMIC, 3/8 IN. DIA.
	211371	426766- 6	INSULATOR - STEAT., 1/2 IN DIA X 1/4 IN LG
	235856	1510922-105	KNOB - CONTROL FOR R301,R455,R488,R492,S303
	235847	1510922-108	KNOB - CONTROL FOR S301 AND S302
	236366	3455911- 1	BUSHING - RUBBER, PIVOT SHOCK MOUNT
	236382	7862770- 5	CLIP - FUSE CLIP FOR R420
	203645	814498- 1	FOOT - ELASTIC TIP
			RF UNIT (PART OF MI-34570 6 KW UNIT)
			CAPACITORS
C601	211196	459684- 41	FEED-THRU, .001 MF 600 V
C602	211196	459684- 41	FEED-THRU, .001 MF 600 V
C603	211196	459684- 41	FEED-THRU, .001 MF 600 V
C604	211196	459684- 41	FEED-THRU, .001 MF 600 V
C605	211196	459684- 41	FEED-THRU, .001 MF 600 V
C606	211148	8907717- 1	FEED-THRU, .001 MF 5000 V
C607	221716	8889785- 2	FEED-THRU, .001 MF 2000 V
C608	54643	8881825- 1	FEED-THRU, .01 MF 250 VAC
C609	54643	8881825- 1	FEED-THRU, .01 MF 250 VAC
C610	221716	8889785- 2	FEED-THRU, .001 MF 2000 V
C611	215869	8946284- 2	VARIABLE, 6.3-142 PF
C612	205070	8898719- 3	VARIABLE, 3-16 PF
C613			CAPACITOR - PART OF XV601
C614	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C615	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C616	73960	990167- 19	CERAMIC, .01 MF 500 V
C617	106944	993026-452	MICA, 430 MMF ±5% 500 V
C618	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C619	227939	8521332- 12	VACUUM, 120 PF 7500 V
C620	209898	479060- 4	CERAMIC, 6800 PF 3500 V
C621	221716	8889785- 2	FEED-THRU, .001 MF 2 KV
C622	217721	8849438- 14	VARIABLE, 3-30 PF, 10 KV
C623			CAPACITOR - PART OF XV602
C624			CAPACITOR - PART OF XV602
C625			CAPACITOR - PART OF XV602
C626	921365	8849438- 26	VACUUM, VARIABLE, 4-250 PF 3000 V
C627	230419	8494421- 1	FEED-THRU, 1500 PF 15,000 V
C651	211196	459684- 41	FEED-THRU, .001 MF 600 V
C652	211196	459684- 41	FEED-THRU, .001 MF 600 V
C653	211196	459684- 41	FEED-THRU, .001 MF 600 V

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
C654	211196	459684- 41	FEED-THRU, .001 MF 600 V
C655	211196	459684- 41	FEED-THRU, .001 MF 600 V
C656	221716	8889785- 2	FEED-THRU, .001 MF 2000 V
C657	211196	459684- 41	FEED-THRU, .001 MF 600 V
C658	211196	459684- 41	FEED-THRU, .001 MF 600 V
C659	211196	459684- 41	FEED-THRU, .001 MF 600 V
C660	211196	459684- 41	FEED-THRU, .001 MF 600 V
C661	211196	459684- 41	FEED-THRU, .001 MF 600 V
C662	211148	8907717- 1	FEED-THRU, .001 MF 5000 V
C663	54643	8881825- 1	FEED-THRU, .01 MF 250 VAC
C664	54643	8881825- 1	FEED-THRU, .01 MF 250 VAC
C665	221716	8889785- 2	FEED-THRU, .001 MF 2000 V
C666	215869	8946284- 2	VARIABLE, 6.3-142 PF
C667	205070	8898719- 3	VARIABLE, 3-16 PF
C668			CAPACITOR - PART OF XV651
C669	73960	990167- 19	CERAMIC, .01 MF 500 V
C673	221447	479060- 7	CERAMIC, 3300 MF 3500 V
C674			CAPACITOR - PART OF XV652
C675	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C676	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C677	73960	990167- 19	CERAMIC, .01 MF 500 V
C678	106944	993026-452	MICA, 430 MMF ±5% 500 V
C679	99177	8825449- 1	FEED-THRU, .001 MF 500 V
C680	57260	8898719- 2	VARIABLE, 4-30 PF
C681	227939	8521332- 12	VACUUM, 120 PF 7500 V
C682			CAPACITOR
C683			CAPACITOR
C684	217634	8971908- 1	VARIABLE, 4.5-102 PF
C685			CAPACITOR - PART OF XV653
C686			CAPACITOR - PART OF XV653
C687	217721	8849438- 14	VARIABLE, 3-30 PF, 10 KV
C688	221716	8889785- 2	FEED-THRU, .001 MF 2 KV
C689			CAPACITOR - PART OF XV653
C690	921365	8849438- 26	VACUUM, VARIABLE, 4-250 PF 3000 V
C691	921365	8849438- 26	VACUUM, VARIABLE, 4-250 PF 3000 V
C692	230419	8494421- 1	FEED-THRU, 1500 PF 15,000 V
C693	209898	479060- 4	CERAMIC, 6800 PF 2500 V
C694	239169	3455474- 41	FILM, .05 MF 10,000 V
C695	239993	3455474- 21	FILM, 0.25 MF 3000 V
C696	239993	3455474- 21	FILM, 0.25 MF 3000 V
C697	214696	8821367- 4	CERAMIC, 100 PF 5000 V
J601	92180	433647- 1	CONNECTOR - AURAL RF INPUT
J651	92180	433647- 1	CONNECTOR - VISUAL RF INPUT
J652	92180	433647- 1	CONNECTOR - VIS. MOD. AMPL. SWAMPING
L601	225083	8914884- 22	COIL - FIRST AURAL AMPLIFIER GRID
L602	57259	8898641- 3	CHOKE - FIRST AURAL AMPLIFIER GRID
L603	232047	3455574-501	COIL - PLATE CHOKE, 1ST AURAL AMPLIFIER
L604	57259	8898641- 3	CHOKE - 1ST AURAL AMPLIFIER CATHODE
L605			INDUCTOR - 1ST AUR. AMPL. PLATE TUNING
L606	232049	8914884- 52	COIL - GRID CHOKE, 2ND AURAL AMPLIFIER
L607			NEUTRALIZING SLOTS - PART OF XV602
L608	232048	3462628- 1	COIL - PLATE CHOKE, 2ND AURAL AMPLIFIER
L609			INDUCTOR - FIXED ADJ. 2ND AUR. AMPL. PLATE
L610			INDUCTOR - 2ND AUR. AMPL. PLATE TUNING
L611	57259	8898641- 3	CHOKE - 1ST AUR. AMP. SCREEN
L612	232047	3455574-501	CHOKE - 1ST AUR. AMP. PLATE
L651	225083	8914884- 22	COIL - FIRST VISUAL AMPLIFIER GRID
L652	57259	8898641- 3	CHOKE - FIRST VISUAL AMPLIFIER GRID
L653			COIL - FIRST VISUAL AMPLIFIER PLATE TUNING
L654	232049	8914884- 52	COIL - PLATE CHOKE, 1ST VISUAL AMPLIFIER
L655	57259	8898641- 3	CHOKE - GRID, SECOND VISUAL AMPLIFIER
L656	232047	3455574-501	COIL - PLATE CHOKE, 2ND VISUAL AMPLIFIER
L657	57259	8898641- 3	CHOKE - 2ND VISUAL AMPLIFIER CATHODE
L658			INDUCTOR - 2ND VIS. AMPL. PLATE TUNING
L659	211203	8914884- 6	COIL - VIS. MOD. AMPL. GRID TRAP
L660			NEUTRALIZING SLOTS - PART OF XV653
L661	232048	3462628- 1	COIL - VIS. MOD. AMPL. PLATE CHOKE
L662			INDUCTOR - FIXED ADJ. VIS. MOD. AMPL. PLATE
L663			INDUCTOR - VIS. MOD. AMPL. PLATE TUNING
L664			LOOP - VISUAL MODULATOR AMPLIFIER OUTPUT

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
L665			LOOP - VISUAL MODULATOR AMPLIFIER SWAMPING
L666	57259	8898641- 3	CHOKE - 2ND VIS. AMP. SCREEN
L667	232047	3455574-501	CHOKE - 2ND VIS. AMP. PLATE
L668	225083	8914884- 22	COIL - CHOKE, 1ST VIS. AMP. CATHODE
P601			CONNECTOR - PART OF CABLE 757412-501
P651			CONNECTOR - PART OF CABLE 757412-503
P652			CONNECTOR - PART OF CABLE 757412-502
			RESISTOR - FIXED COMPOSITION, UNLESS NOTED
R601	95242	458575- 18	VARIABLE, 1 MEGOHM 2 W
R602	522010	99126- 38	10 OHMS ±10% 2 W
R603	522110	99126- 50	100 OHMS ±10% 2 W
R651	95242	459575- 18	VARIABLE, 1 MEGOHMS 2 W
R652	102241	993008-101	WIRE WOUND, 10,000 OHMS ±5% 10 W
R653	522012	99126-113	12 OHMS ±5% 2 W
R654	522012	99126-113	12 OHMS ±5% 2 W
R656	522010	99126- 38	10 OHMS ±10% 2 W
R657	522010	99126- 38	10 OHMS ±10% 2 W
R658	211077	891769- 22	WIRE WOUND, 2.5 MEGOHMS ±1% 2 W
R659	522415	99126-224	510,000 OHMS ±5% 2 W
R660	211075	891769- 20	WIRE WOUND, 500,000 OHMS ±1% 2 W
R661	522012	99126-113	12 OHMS ±5% 2 W
R662	522012	99126-113	12 OHMS ±5% 2 W
R663	95113	8888772- 7	WIREWOUND, 3 OHMS ±5% 20 W NON-INDUCTIVE
R664	211138	8917168- 1	FILM, 300 OHMS ±5% 70 W
XV601	231292	3462551- 1	SOCKET - 4CX300A
XV602			SOCKET - TUBE 4CX5000A
XV651	215844	464586- 2	SOCKET - 7034
XV652	231292	3462551- 1	SOCKET - 4CX300A
XV653			SOCKET - 4CX5000A
			MISCELLANEOUS
	99933	464586- 3	CHIMNEY - CERAMIC, FOR 7034 AND 4CX300A TUBES
	225111	8946297- 2	SPRING - BERYLLIUM COPPER CONTACT, MOD. AND EXC. GROUNDING
	231459	8494388- 1	SHELF - POLYPROPYLENE, 11.33 IN X 11.40 IN VISUAL
	231460	8494373- 1	PLATE - BRASS, C689 SUPPORT
	231461	8494389- 1	SUPPORT - POLYPROPYLENE, 3 IN X 0.50 IN
	231462	8494389- 2	SUPPORT - POLYPROPYLENE, 7 IN X 0.50 IN
	231463	8494389- 3	SUPPORT - POLYPROPYLENE, 10.25 IN X 0.50 IN
	231464	8494389- 4	SUPPORT - POLYPROPYLENE, 3.19 IN X 0.50 IN
	231465	8494389- 5	SUPPORT - POLYPROPYLENE, 10.25 IN X 0.50 IN (4 HOLES, NO. 8 TAP)
	215854	8413444-501	CONTACT ASSY - 4 7/8 IN LG, DOOR GROUNDING
	215855	8413444-502	CONTACT ASSY - 3 3/4 IN LG, DOOR GROUNDING
	215856	8413444-503	CONTACT ASSY - 10 1/2 IN LG, DOOR GROUNDING
	231310	8413444-513	CONTACT ASSY - 18.50 IN LG, DOOR GROUNDING
	233871	480368- 8	FASTENER ASSEMBLY - DOOR
	99376	8886047- 1	RETAINER - RING, FOR FASTENER ASSY, DOOR
	94641	8914329- 1	FASTENER - RECEPTACLE, DOOR
	231466	3462538- 1	FLANGE - 8.38 IN OD BRASS, AIR CHIMNEY SUPPORT
	208040	891997- 33	LUBRICATE - MOLYKOTE POWDER
	231469	8494390- 1	PLATE - METHACRYLATE, 11.32 IN X 3.56 IN, SIDE
	231470	8494390- 2	PLATE - METHACRYLATE, 12.37 IN X 3.56 IN, REAR
	217651	8973315-501	CAPACITOR - (TUBE SOCKET) ASSY, C625/C689
	217658	8436554-501	CONTACT - ASSEMBLY
	232297	3471537-501	SOCKET - TUBE SOCKET ASSY, FIL.-GRID-SCREEN
	232300	8465194-501	CONTACT - SCREEN GRID COLLET ASSEMBLY
	232298	3462635-501	CONTACT ASSY - SLIDING, NEUTRALIZING BUTTONS
	220958	644382- 4	COLLET - CONTROL GRID CONTACTS

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
	220959	644382- 5	COLLET - OUTER FILAMENT CONTACTS
	220960	644382- 6	COLLET - INNER FILAMENT CONTACTS
	225106	8519978- 1	RING - INSULATOR (2 USED) INNER FILAMENT
	225087	8863044- 7	BUSHING (6 USED) TEFLON WASHER, INNER FILAMENT
	231309	8519977- 1	INSULATOR - POST (4 USED) GRID COLLET SUPPORT
	232299	3462630-501	PLATE - ASSEMBLY (4 USED) SCREEN BYPASS
	225081	8446964- 2	CAPACITOR - SILVERED MICA, FIL. AND SCREEN BYPASS
	97459	426763- 3	INSULATOR - STEAT., 3/4 DIA X 0.425 LG, FILAMENT
	217719	426763- 9	INSULATOR - STEAT., 3/4 DIA X 7/16 LG, SCREEN
	232302	3462634- 2	SPACER - BRASS, FIXED NEUTRALIZING BUTTON
	232301	3462634- 1	SPACER - BRASS, STEPPED NEUTRALIZING BUTTON
	208115	426765- 9	INSULATOR - STEAT., 3/8 DIA X 0.750 LG, SCREEN COLLET
	232830	3455512-502	CONTACT ASSY - BERYLLIUM COPPER, L610/L663
	231472	8533793- 1	SCREW - LEAD-POLYPROPYLENE, 0.500 IN DIA, L663
	208711	8898610- 1	COUPLING - STEATITE, FLEXIBLE, FOR 1/4 IN SHAFT
	225093	8985590- 2	CONTACT - BERYLLIUM COPPER, 0.257 DIA HOLES SHAFT GROUNDING
	231296	8838035-502	SPROCKET - ASSEMBLY, 15 TEETH
	231475	8543479- 1	SUPPORT - POLYPROPYLENE, 1.50 IN X 2.25 IN X 0.375 IN THICK, L653 REAR DRIVE SUPPORT
	231476	8543464- 1	COIL - 5.5 RH TURNS COPPER TUBING (L653)
	210083	426766- 15	INSULATOR - STEATITE 1/2 IN DIA X 1.5 IN LG
	231477	8543480- 1	GUIDE - RACK POLYPROPYLENE 2.58 IN X 1.75 IN X 0.750 IN THICK, L653 FRONT DRIVE SUPPORT
	231478	8543481- 1	COUPLING - POLYPROPYLENE ROD, 0.750 IN DIA, L653 DRIVE
	231479	8543482- 1	SHAFT - COIL, POLYPROPYLENE ROD, 6.75 IN LG L653
	231480	8976368- 1	CORE - COIL, L653 TUNING
	231295	8946214- 3	DRIVE - RIGHT ANGLE, C690/L653 TUNING DRIVE
	225114	8881010- 17	SPROCKET - 10 TEETH
		8642690-505	COUNTER ASSY - FIRST VIS. AMPL. TUNING
	214657	8914897- 2	BLOCK - BEARING ASSEMBLY
	207735	8827596- 1	COUNTER
	212531	8914895-501	GEAR - ASSEMBLY
	97461	8827138- 2	GEAR - (3 USED)
	70527	8888539-122	SET SCREW
	251825	990331-143	PIN
	208040	891997- 33	LUBRICANT - MOLYKOTE
	225114	8881010- 17	SPROCKET
	231115	8880670- 14	CHAIN - 48 INCHES LONG
	99899	8811014- 1	LINK - CHAIN
	55913	897258- 3	CLAMP - ADJUSTABLE 1 5/16 IN TO 2 1/4 IN ID
	231481	3462539-501	TUBE ASSY - BRASS, 4CX300A AIR INLET
	231482	3467515-501	PLATE ASSY - XV601 MOUNTING AND SHIELD
	231483	3467515-502	PLATE ASSY - XV652 MOUNTING AND SHIELD
	211247	426764- 3	INSULATOR - STEAT. BUSHING, 0.62 IN LG, XV652 GRID FEED
	211246	426764- 53 -	INSULATOR - STEAT. BUSHING, 0.38 IN LG, XV652 GRID FEED
	231484	8533784- 2	SUPPORT - 4.38 IN X 1.62, L605 AND L658
	53348	426766- 12	INSULATOR - STEATITE, 1/2 IN DIA X 1.250 IN
	215862	8944285-501	CONTACT ASSEMBLY - 1 3/8 IN LG, L605/L658
	235656	8946209- 3	SCREW - POLYPROPYLENE ROD, L605 AND L658
	225110	8971992- 1	SPACER - TEFLON, 5/8 IN OD X 1/4 IN ID
	208091	897158- 5	COUPLING - USED ON C626, C690 AND C691
	210376	426766- 9	INSULATOR - STEATITE, 1/2 IN DIA X 1 IN LG
	213996	69916- 10	KNOB - CONTROL, BLACK 3/4 IN DIAMETER
	232829	3455636- 1	CONNECTOR - BRONZE, SLOTTED, OUTPUT LINE

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 2			
	208738	426761- 6	INSULATOR - STEAT., FEED-THRU, I INSIDE AIR DUCT
	208729	8903217- 1	PLATE - BRASS, 1 1/4 IN OD X 1/8 THICK, 8-32 TAP
	208728	8903218- 1	CAPACITOR - TEFLON, 1 1/2 IN DIA X 0.020 THK, 0.173 HOLE
	101592	8888539-143	SCREW - SET, 8-32 X .19 IN LONG
	70527	8888539-122	SCREW - SET, 6-32 X .19 IN LONG
	231298	8838035-501	SPROCKET - ASSEMBLY, 30 TEETH
	233658	8521386- 3	CONTACT - SPARK GAP, 4CX5000A SCREENS
	208116	426765- 12	INSULATOR - STEATITE, 3/8 IN DIA X 1 IN LG
	211423	426765- 3	INSULATOR - STEATITE, 3/8 DIA X 0.500 IN LG
	211079	426766- 18	INSULATOR - STEATITE, 0.50 DIA X 2.00 IN LG
	97458	426767- 6	INSULATOR - STEATITE, 0.75 DIA X 1.25 IN LG
	215847	477962- 1	DRIVE - RIGHT ANGLE 1 TO 1, C684 DRIVE
	230555	8956347-501	CLAMP ASSEMBLY - 7034 AND 4CX300A ANODE CONNECTION
	54371	897258- 1	CLAMP - ADJUSTABLE, C626 MOUNTING
	99398	188183- 12	BEARING - BALL, L610 AND L663 DRIVE
	209090	426773- 18	INSULATOR - STEATITE, 0.75 DIA X 3.0 IN LG
	237252	3455756-101	SPROCKET - 20 TEETH, 5/8 HOLE
	237253	3462627- 2	COUPLING - POLYPROPYLENE, L610/L663 DRIVE
	235870	8858926- 2	LINK - OFFSET, DRIVE CHAIN
	211160	8914845-501	CONTACT ASSEMBLY - VIS. OUTPUT LOOP L664
	231468	3462687- 1	TUBE - COPPER 7.12 IN LG, 4CX5000A EXHAUST CHIMNEY
	231467	3462505- 4	TUBE - INSULATED, 4CX5000A EXHAUST CHIMNEY
	236841	8533793- 6	SCREW - LEAD SCREW, 0.500 DIA X 11 IN LG, FOR L610
	236842	8494388- 2	SHELF - POLYPROPYLENE, 11.33 X 11.40, AURAL
	211079	426766- 18	INSULATOR - STEATITE, 1/2 IN DIA X 2 IN LG
	42736	99045- 4	CLIP - FUSE CLIP
	52717	7862770- 1	CLIP - FUSE CLIP
	209711	426773- 9	INSULATOR - STEAT., 0.75 SQ X 1.50 LG
PREFIX 6			
			REFLECTOMETER ASSEMBLY (PART OF MI-34570-A 6KW DRIVER UNIT)
	211123	8838090-501	CAP - ASSEMBLY
	92180	433647- 0	CONNECTOR - COAXIAL, FEMALE
	95078	898352- 12	INSULATOR - TEFLON
		744475-502	REFLECTOMETER - ASSEMBLY
C3	92036	727866-171	CAPACITOR - MICA, 0.01 MF ±10% 300 V
C1	45469	90575-333	CAPACITOR - RF FILTER, 100 MMF 500 V
C5	45469	90575-333	CAPACITOR - RF FILTER, 100 MMF 500 V
C7	45469	90575-333	CAPACITOR - RF FILTER, 100 MMF 500 V
L1	55829	8856516-501	COIL - DIODE TUNING
		738363-502	HEAD - ASSEMBLY
	204008	8855429-501	LOOP - ASSEMBLY
	48643	76757- 20	BALL
	204009	450132- 8	SPRING
R5	502168	727834- 12	RESISTOR - RF FILTER, 680 OHMS
	225857	984059-228	RESISTOR - RF FILTER, 750,000 OHMS ±1%
	53016	99369- 1	SHIELD - TUBE
	96167	99370- 3	SOCKET - TUBE (6AL5)
PREFIX 7			
			MI-27464 AURAL REFLECTOMETER
	211123	8838090-501	CAP - ASSEMBLY
	92180	433647- 1	CONNECTOR - COAXIAL, FEMALE
	95078	898352- 12	INSULATOR - TEFLON
		744475-502	REFLECTOMETER - ASSEMBLY
	92036	727866-171	CAPACITOR - MICA, 0.01 MF ±10% 300 V
	45469	90575-333	CAPACITOR - RF FILTER, 100 MMF 500 V

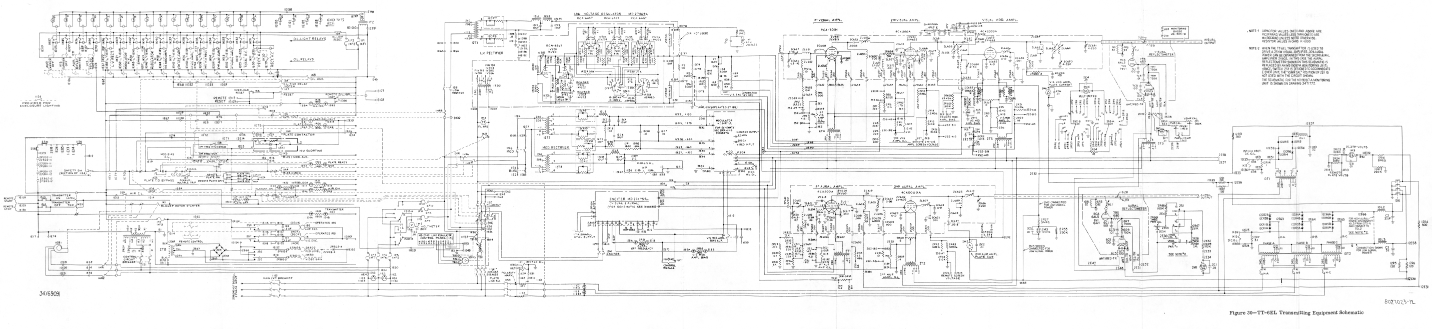
Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 7			
	55829	8856516-501	COIL - DIODE TUNING
		738363-502	HEAD - ASSEMBLY
	204008	8855429-501	LOOP - ASSEMBLY
	48643	76757- 20	BALL
	204009	450132- 8	SPRING
	502168	727834- 12	RESISTOR - RF FILTER, 680 OHMS
	225857	984059-228	RESISTOR - RF FILTER, 750,000 OHMS ±1%
	53016	99369- 1	SHIELD - TUBE
	96167	99370- 3	SOCKET - TUBE (6AL5)
PREFIX 10			MI-34590 TRANSFORMER FILTER ASSEMBLY
C1	239958	3462543- 5	CAPACITOR - PAPER, 32 MF 3000 VDC
C2	239401	3471769- 13	CAPACITOR - FILM, 32 MF 6000 V
C3	239401	3471769- 13	CAPACITOR - PAPER, 32 MF 6000 VDC
L1	233624	3462668- 1	REACTOR - FILTER, 10 HENRY
L2	229894	8494093- 1	REACTOR - FILTER, 3 HENRY
L3	229894	8494093- 1	REACTOR - FILTER, 3 HENRY
T1	233623	8445491- 2	TRANSFORMER - PLATE
VR1			LINE REGULATOR (MI-27472)
			MI-34464 BLOWER ENCLOSURE AND FILTER PANEL
	225125	888488- 5	FILTER - AIR, 19 3/4 X 15 15/16 X 1 15/16
	59665	727537- 5	CATCH - FRICTION, FEMALE (SPRING)
	59237	727537- 98	CATCH - FRICTION, MALE (PIN)
			MI-34463 BLOWER
	227991		BEARING - FAN SHAFT
	227989		BELT - DRIVE, BP48
	227986		MOTOR - 3HP, 3600 RPM, 220V, 3 PHASE, 50/60 CYCLE
	227990		MOUNT - SHOCK, BLOWER
	227988		PULLEY - FAN, SINGLE GROOVE, 4.3/5.3 PD, 15/16 IN BORE 3.7/4.7 PD, 1 1/8 IN BORE
	227987		PULLEY - MOTOR, SINGLE GROOVE,
			MI-27472 LINE REGULATOR
	94820	949414- 3	TRANSFORMER - LINE REGULATOR SINGLE PHASE
			MI-34594 HIGH VOLTAGE TRANSFORMER
	239213	3462971- 2	REACTOR - LINE CURRENT LIMITING
PREFIX 11			MI-34472-A (ITEM 1) PLATE CONTACTOR PANEL
K1	210589	3464117- 1	CONTACTOR
	239996	3464117- 11	CONTACTS - N.C. AUXILIARY (2 USED)
	239995	3464117- 21	CONTACTS - MAIN (3 USED) CONSISTS OF 1 STATIONARY AND 1 MOVABLE
	239994	3464117- 31	COIL
R2 TO R7	216025	99037- 48	RESISTOR - WIREWOUND, 50,000 OHMS 200 W

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 11			
X11	47167	8871579- 1	SOCKET - LAMP
X12	47167	8871579- 1	SOCKET - LAMP
	95226	818337- 9	TERMINAL
	97468	834180- 10	SHOCK - MOUNTING FOR K1
	209711	426773- 9	INSULATOR - STEAT., 0.75 SQ X 1.50 LG
	52717	7862770- 1	CLIP - FUSE CLIP
			MI-34472-A (ITEM 2) SWITCHGEAR PANEL
I3			LAMP - (PART OF INSTALLATION MATERIAL)
R1	96813A	464569- 1	RESISTOR - 51 OHMS 600 W (LOAD)
S1	239212	3471761- 11	BREAKER - CIRCUIT
S2	211695	482784- 1	CIRCUIT - BREAKER (AUX)
S3	210744	8908888- 1	SWITCH
S4	19863	860380- 3	SWITCH - TUMBLER
S6	54920	8881052- 1	SWITCH - INTERLOCK
T1	95685	949469- 1	TRANSFORMER
T2	95685	949469- 1	TRANSFORMER
X13	47167	8871579- 1	SOCKET - LAMP
X14	47167	8871579- 1	SOCKET - LAMP
	209734	8904356- 1	BUMPER - RUBBER, 17/32 DIA
PREFIX 12			MI-34573-A RECTIFIER PANEL
			CAPACITORS
C1 TO C7	18118	990193- 29	PAPER, 10 MF 1000 V
C8	18501	990193- 8	PAPER, 10 MF 600 V
C9	43441	990193- 11	PAPER, 20 MF 600 V
C10	219919	990421- 77	PAPER, 0.47 MF 600 V
CR1A/B TO CR6A/B	230914	3462541- 1	RECTIFIER - HIGH VOLTAGE
	235119		MODULE - RIGHT HAND UNIT (CR304)
	235120		MODULE - LEFT HAND UNIT (CR304)
CR7	225119	8722964-501	RECTIFIER - LOW VOLTAGE
CR8	225119	8722964-501	RECTIFIER - LOW VOLTAGE
CR9	225119	8722964-501	RECTIFIER - MOD. HIGH VOLTAGE
CR10	225119	8722964-501	RECTIFIER - MOD. HIGH VOLTAGE
CR11	225119	8722964-501	RECTIFIER - MOD. BIAS
CR12	227887	8722934-501	RECTIFIER - MOD. LOW VOLTAGE
I1			LAMP - GREEN, PART OF INSTALLATION MATERIAL
K1	217759	8436511- 1	CONTACTOR - HIGH VOLTAGE GROUNDING
	217812		COIL - 115 V, 60 CYCLE
	209599		CONTACT - MOVING
	217811		CONTACT - STATIONARY
L1	95357	949430- 1	REACTOR - LOW VOLTAGE FILTER
L2	95357	949430- 1	REACTOR - LOW VOLTAGE FILTER
L3	95357	949430- 1	REACTOR - MODULATOR HIGH VOLTAGE FILTER
L4	93658	949251- 1	REACTOR - MODULATOR LOW VOLTAGE FILTER
			RESISTORS - FIXED COMPOSITION, UNLESS NOTED
R1	209920	8888772- 33	WIRE WOUND, 150 OHMS 200 W NON-IND
R2	209920	8888772- 33	WIRE WOUND, 150 OHMS 200 W NON-IND
R3	44231	99037- 28	WIRE WOUND, 500 OHMS 200 W
R4	44231	99037- 28	WIRE WOUND, 500 OHMS 200 W
R5	52345A	99037- 22	WIRE WOUND, 120 OHMS 200 W
R6	52345A	99037- 22	WIRE WOUND, 120 OHMS 200 W
R7	210377	99037- 6	WIRE WOUND, 3.1 OHMS 200 W
R8	230916	990638- 19	WIRE WOUND, 0.8 OHMS 8 W
R9	230917	990638- 27	WIRE WOUND, 2 OHMS 8 W
R10	93632	99033- 45	WIRE WOUND, 25,000 OHMS 95 W
R11	522418	99126- 89	180,000 OHMS ±10% 2 W
R12	522418	99126- 89	180,000 OHMS ±10% 2 W

Symbol	*Stock No.*	*Drawing No.*	*Description*
PREFIX 12			
R13	522110	99126- 50	100 OHMS ±20% 2 W
R15	522427	99126- 90	220,000 OHMS ±10% 2 W
R16	229791	8702674-511	MULTIPLIER, 8 MEGOHMS
T1	225121	8442961- 1	TRANSFORMER - LOW VOLTAGE RECTIFIER
T2	225122	476468- 2	TRANSFORMER - MODULATOR H.V. RECTIFIER
T3	225123	8463966- 1	TRANSFORMER - MODULATOR L.V. RECTIFIER
X11	47167	8871579- 1	SOCKET - LAMP
			MISCELLANEOUS
	210375	426774- 6	INSULATOR - STEATITE 1 IN SQ X 2 IN
	209711	426773- 9	INSULATOR - STEATITE 3/4 IN SQ X 1 1/2 IN
	52717	7862770- 1	CLIP - FUSE
	208680	426765- 18	INSULATOR - STEATITE, 3/8 IN DIA X 1 1/2 IN
	217742	426772- 15	INSULATOR - STEATITE, 1/2 IN SQ X 2 IN LG
	229888	3455532- 3	PLUG - BANANA TYPE
	230439	3455532- 1	JACK - BANANA TYPE
	209091	426767- 12	INSULATOR - STEAT., 0.75 DIA X 2.00 LG
NO PREFIX			
			MI-27471 LINE REGULATOR CONTROL PANEL
		949414- 2	REGULATOR CONTROL PANEL
	98609		RELAY - VOLTAGE REGULATING
	98454		CONTACTS - MOVABLE
	97387		CONTACTS - STATIONARY
	97389		COIL
	98610		RELAY - MOTOR CONTROL
	97391		CONTACT ASSEMBLY - R.H. MOVABLE
	97392		CONTACT ASSEMLBY - L.H. MOVABLE
	97390		CONTACTS - STATIONARY
	97393		COIL
			MI-19051-B MONITORING DIODE
			CAPACITORS
C101	78228	90581-307	CERAMIC, 8 MMF ±10%, 500 V
C102	78228	90581-307	CERAMIC, 8 MMF ±10%, 500 V
C103	76992	727851-139	MICA, 470 MMF ±10%, 300 V
C104	76992	727851-139	MICA, 470 MMF ±10%, 300 V
C105	218777	727866-151	MICA, 1500 MMF ±10%, 500 V
C106	218777	727866-151	MICA, 1500 MMF ±10%, 500 V
C108	98671	8898778-501	PROBE
J101	51800	727215- 3	CONNECTOR - FEMALE, COAXIAL CHASSIS MOUNTED
J102	48743	891356- 1	CONNECTOR - MALE, TWO CONTACT, CHASSIS MOUNTED
L101	58632	8898780-501	COIL - AIR CORE
L102	78466	8886161- 3	CHOKE - AIR CORE, 1.8 MH, 1000 MA
L102-A	58097	8898641- 1	REACTOR - R.F. CHOKE
P101	66344	252868- 1	CONNECTOR - MALE, COAXIAL, CABLE MOUNTED
P102	4573	67089- 4	CONNECTOR - FEMALE, TWO CONTACT, CABLE MOUNTED
R101	512210	727836- 62	RESISTOR - 1000 OHM ±10%, 1 W
R103	512082	90496-133	RESISTOR - 82 OHM ±5%, 1 W
T101	65613	949113- 1	TRANSFORMER - FILAMENT
X101	94925	99198- 4	SOCKET - TUBE, 7 CONTACT MINIATURE
			MISCELLANEOUS
	54371	897258- 1	CLAMP - 3 1/8 INCHES
	94426	897258- 2	CLAMP - 1 5/8 INCHES

Symbol	*Stock No.*	*Drawing No.*	*Description*
NO PREFIX			
			MI-27132-A 4.75 MC LOW PASS FILTER
			CAPACITOR
C1	229046	993026-675	MICA, 3900 PF ±2%, 500 V
C2	229047	993026-653	MICA, 470 PF ±2%, 500 V
C2A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C3	229048	993026-657	MICA, 680 PF ±2%, 500 V
C3A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C4	229048	993026-657	MICA, 680 PF ±2%, 500 V
C4A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C5	229047	993026-653	MICA, 470 PF ±2%, 500 V
C5A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C6	220252	993026-648	MICA, 300 PF ±2%, 500 V
C6A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C7	229049	993026-679	MICA, 5600 PF ±2%, 500 V
C7A	211495	728691-107	MICA, VARIABLE 90-470 PF 500 V
C8	220252	993026-648	MICA, 300 PF ±2%, 500 V
C8A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C9	229050	993026-674	MICA, 3600 PF ±2%, 500 V
C9A	204345	728691-105	MICA, VARIABLE 20-270 PF 500 V
C10	921435	993026-659	MICA, 820 PF ±2%, 500 V
C10A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C11	921435	993026-659	MICA, 820 PF ±2%, 500 V
C11A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C12	229051	993026-693	MICA, 22,000 PF ±2%, 500 V
C12A	229052	728691-109	MICA, VARIABLE 180-770 PF 500 V
C13	218465	993026-661	MICA, 1,000 PF ±2%, 500 V
C13A	204344	928691-104	MICA, VARIABLE 10-160 PF 500 V
C14	218465	993026-661	MICA, 1,000 PF ±2%, 500 V
C14A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C15	222388	993026-665	MICA, 1,500 PF ±2%, 500 V
C15A	204345	728691-105	MICA, VARIABLE 20-270 PF 500 V
C16	218466	993026-663	MICA, 1,200 PF ±2%, 500 V
C16A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C17	218466	993026-663	MICA, 1,200 PF ±2%, 500 V
C17A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
C18	229047	993026-653	MICA, 470 PF ±2%, 500 V
C18A	204344	728691-104	MICA, VARIABLE 10-160 PF 500 V
J1	51800	1510021-111	CONNECTOR - COAXIAL RECEPTACLE
J2	51800	1510021-111	CONNECTOR - COAXIAL RECEPTACLE
L1	229053	8819022-503	COIL - VIDEO PEAKING
L2	204777	8819022-501	COIL - VIDEO FILTER
L3	204778	8819022-502	COIL - VIDEO FILTER
L4	204777	8819022-501	COIL - VIDEO FILTER
L5	229054	8819021-505	COIL - VIDEO DELAY
L6	229055	8819021-506	COIL - VIDEO DELAY
L7	229056	8819021-507	COIL - VIDEO DELAY
L8	229057	8819021-508	COIL - VIDEO DELAY
L9	229058	8819021-509	COIL - VIDEO DELAY
L10	229059	8819021-510	COIL - VIDEO DELAY
			RESISTORS - FIXED COMPOSITION, UNLESS NOTED
R1	502012	82283-113	12 OHM ±5%, 1/2 W
R2	502075	82283-132	75 OHM ±5%, 1/2 W
R3	502075	82283-132	75 OHM ±5%, 1/2 W
R4	502133	82283-147	330 OHM ±5%, 1/2 W
S1	99673	433007- 4	SWITCH - DPDT TOGGLE
T1	229060	8819020-503	TRANSFORMER - VIDEO FILTER
T2	229061	8819020-504	TRANSFORMER - VIDEO FILTER
			MISCELLANEOUS
	210715	8909771-501	COAXIAL TERMINATION, 75 OHM ±1%,
	215661	1510021-103	CONNECTOR - (FOR COAXIAL CABLE)
	74337	990502- 7	RETAINER

Symbol	*Stock No.*	*Drawing No.*	*Description*
NO PREFIX			MI-34592-A INSTALLATION MATERIAL
C1	610003	36655-503	CAPACITOR - MICA, .01 MF
C2	610003	36655-503	CAPACITOR - MICA, .01 MF
		3467672-501	RECTIFIER - ASSEMBLY
	210375	426774- 6	INSULATOR - STEAT., 1.00 SQ X 2.00 LG
CR13	230915	3462540- 1	RECTIFIER - ASSEMBLY, INT. H.V.
CR14	230915	3462540- 1	RECTIFIER - ASSEMBLY, INT. H.V.
CR15	230915	3462540- 1	RECTIFIER - ASSEMBLY, INT. H.V.
CR16	230915	3462540- 1	RECTIFIER - ASSEMBLY, INT. H.V.
1HR1	210374	8910653- 27	HEATER - THERMAL O.L. TRIP (BLOWER)
1HR2	210374	8910653- 27	HEATER - THERMAL O.L. TRIP (BLOWER)
1HR3	215803	8910653- 31	HEATER - THERMAL O.L. TRIP (FILAMENT)
1HR4	215803	8910653- 31	HEATER - THERMAL O.L. TRIP (FILAMENT)
1HR5	210371	8910653- 12	HEATER - THERMAL O.L. TRIP (EXCITER)
1HR6	212561	8910653- 19	HEATER - THERMAL O.L. TRIP (MODULATOR)
1HR7	210370	8910653- 1	HEATER - THERMAL O.L. TRIP (BIAS)
1HR8	236552	8910653- 22	HEATER - THERMAL O.L. TRIP (L.V. RECTIFIER)
11I1	218369	887928- 5	LAMP - RED (SAFETY)
11I2	218369	887928- 5	LAMP - RED (SAFETY)
11I3	57284	872291- 12	LAMP - NEON
11I4	57284	872291- 12	LAMP - NEON
12I1	227985	887928- 4	LAMP - GREEN (SAFETY)
M1	235836	993064- 6	METER - AURAL REFLECTOMETER
M2	237102	993052-152	METER - AURAL AMPL, PLATE CURRENT
1R9	43854	99033- 43	RESISTOR - WIREWOUND, 16,000 OHMS 95 W
1R10	44308	99027- 37	RESISTOR - WIREWOUND, 4000 OHMS 25 W
1R12	219567	99033- 42	RESISTOR - WIREWOUND, 12.500 OHMS 95 W
	217735	8820789- 5	BOOT - BLOWER TO AIR DUCT
	237254	3462527-502	CRANK - ASSEMBLY, TUNING


VISUAL OUTPUT
AURAL OUTPUT
PLATE VOLTS
REMOTE PLATE VOLTS
INT. H.V. RECT. D.C. O.L.
PHASE A
PHASE B
PHASE C
FOR HIGH AURAL POWER DISCONNECT 10L3 FROM 10T2-N AND CONNECT TO 10L2
SEE NOTE #2
CONNECTION SHOWN FOR LOW AURAL POWER
3416309
8027023-TL

NOTE-1 CAPACITOR VALUES ONE (1) AND ABOVE ARE PICOFARAD, VALUES LESS THAN ONE (1) ARE MICROFARAD UNLESS NOTED OTHERWISE. RESISTOR VALUES IN OHMS K=1000

NOTE-2 WHEN THE TT-6EL TRANSMITTER IS USED TO DRIVE A 25 KW VISUAL AMPLIFIER, 20% AURAL POWER CAN BE OBTAINED FROM THE SECOND AURAL AMPLIFIER 2V602. IN THIS CASE THE AURAL REFLECTOMETER SHOWN ON THIS SCHEMATIC IS REPLACED BY AN MI-19087-A MONITORING UNIT; HENCE, SWITCH 2S1 IS DESIGNED TO ACCOMMODATE EITHER UNIT. THE "VSWR CAL" POSITION OF 2S1 IS NOT USED WITH THE CIRCUIT SHOWN.
THE SCHEMATIC FOR THE MI-19087-A MONITORING UNIT IS SHOWN ON DRAWING 3471777.

Figure 30—TT-6EL Transmitting Equipment Schematic

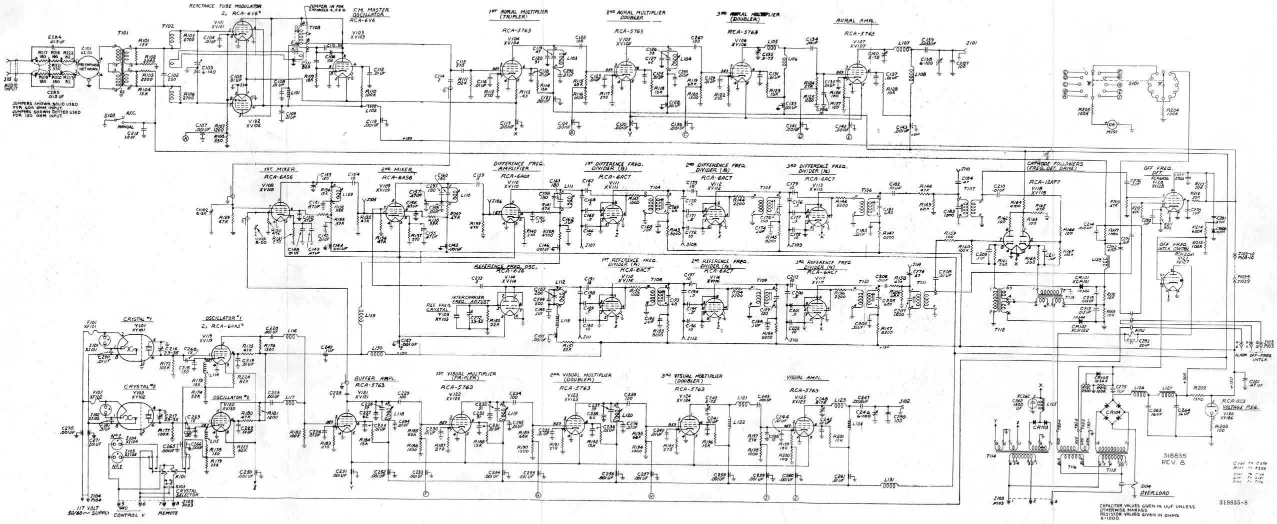
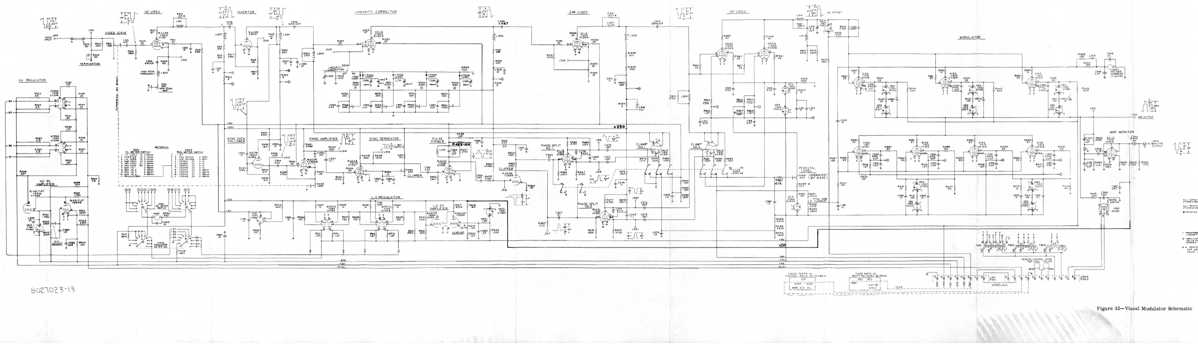
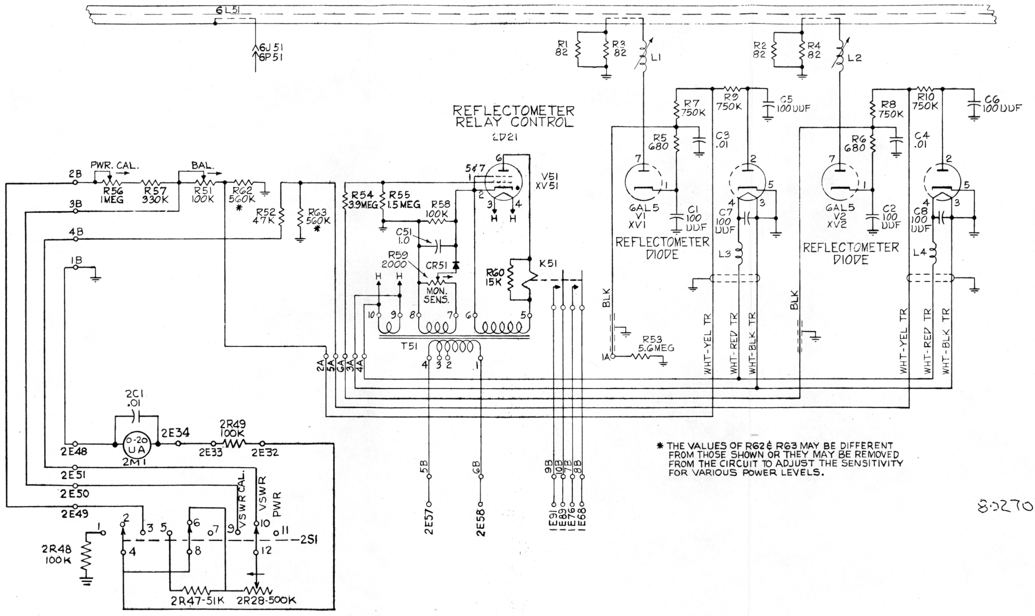

REACTANCE TUBE MODULATOR
2, RCA-6V6'S
JUMPER IN FOR CHANNELS 4,5 & 6
F.M. MASTER OSCILLATOR
RCA-6V6
1ST AURAL MULTIPLIER (TRIPLER)
RCA-5763
2ND AURAL MULTIPLIER DOUBLER
RCA-5763
3RD AURAL MULTIPLIER (DOUBLER)
RCA-5763
AURAL AMPL.
RCA-5763
PRE-EMPHASIS NETWORK
J115 AUDIO INPUT
JUMPERS SHOWN SOLID USED FOR 600 OHM INPUT.
JUMPERS SHOWN DOTTED USED FOR 150 OHM INPUT.
S102 A.F.C. MANUAL
S101
M101
1ST. MIXER
RCA-6AS6
2ND. MIXER
RCA-6AS6
DIFFERENCE FREQ. AMPLIFIER
RCA-6AQ5
1ST DIFFERENCE FREQ. DIVIDER (1/3)
RCA-6AC7
2ND DIFFERENCE FREQ. DIVIDER (1/4)
RCA-6AC7
3RD DIFFERENCE FREQ. DIVIDER (1/5)
RCA-6AC7
CATHODE FOLLOWERS (FREQ. DET. DRIVE)
RCA-12AT7
OFF FREQ. DET.
RCA-6AS6
OFF FREQ. INTLK. CONTROL
RCA-2D21
REFERENCE FREQ. OSC.
RCA-6J6
INTERCARRIER FREQ. ADJUST
REF. FREQ. CRYSTAL
1ST. REFERENCE FREQ. DIVIDER (1/4)
RCA-6AC7
2ND. REFERENCE FREQ. DIVIDER (1/4)
RCA-6AC7
3RD. REFERENCE FREQ. DIVIDER (1/5)
RCA-6AC7
CRYSTAL #1
CRYSTAL #2
OSCILLATOR #1
2, RCA-6AK5'S
OSCILLATOR #2
BUFFER AMPL.
RCA-5763
1ST. VISUAL MULTIPLIER (TRIPLER)
RCA-5763
2ND. VISUAL MULTIPLIER (DOUBLER)
RCA-5763
3RD. VISUAL MULTIPLIER (DOUBLER)
RCA-5763
VISUAL AMPL.
RCA-5763
S103 CRYSTAL SELECTOR
117 VOLT 50/60~ SUPPLY
GND
CONTROL V.
REMOTE
ALARM
OFF-FREQ INTLK
RCA-OD3 VOLTAGE REG.
S104 OVERLOAD
318835 REV. 8
C101 TO C299
R101 TO R223
J101 TO J114
L101 TO L131
T101 TO T116
CAPACITOR VALUES GIVEN IN UUF UNLESS OTHERWISE MARKED.
RESISTOR VALUES GIVEN IN OHMS.
K=1000.
318835-8

Figure 31—Aural and Visual Exciter Schematic


MODULATOR
MOD MONITOR
MOD OUTPUT
TOT MOD CURRENT 0-800 MA
HV REGULATOR
LV REGULATOR
LINEARITY CORRECTION
INVERTER

8027023-13

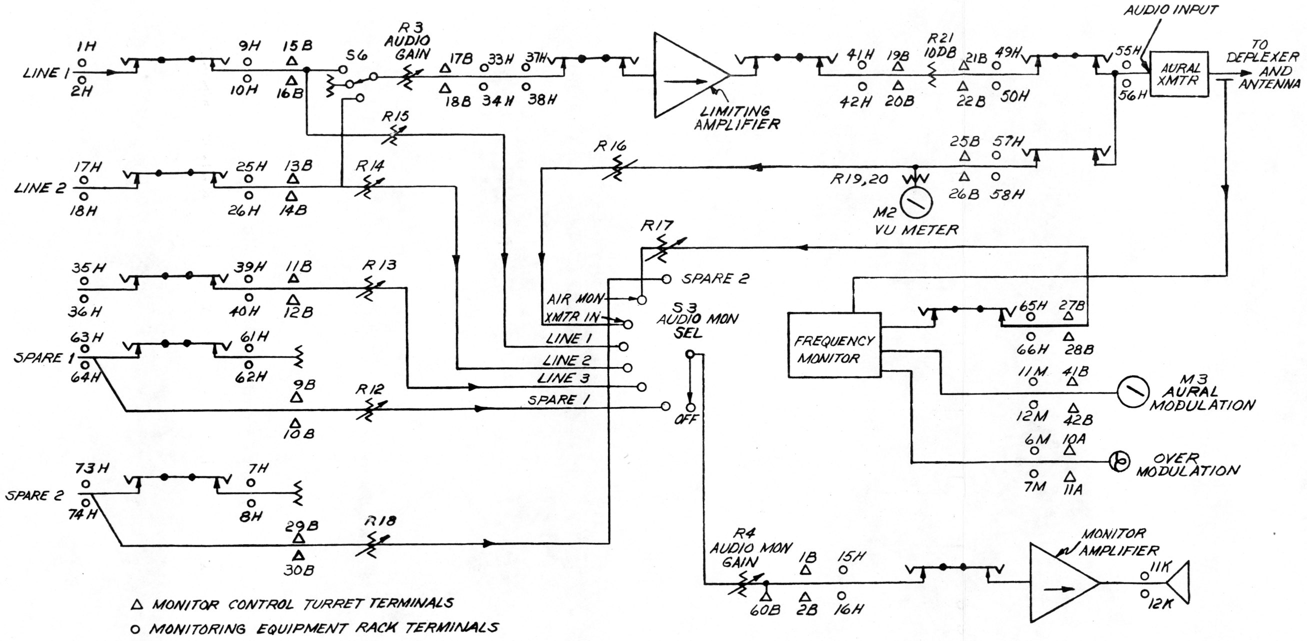
Figure 32—Visual Modulator Schematic


6L51
6J51
6P51
R1
82
R3
82
L1
R2
82
R4
82
L2
REFLECTOMETER
RELAY CONTROL
2D21
PWR. CAL.
BAL.
2B
3B
4B
1B
R56
1MEG
R57
330K
R51
100K
R62
560K
*
R52
47K
R63
560K
*
R54
3.9MEG
R55
1.5MEG
R58
100K
C51
1.0
R59
2000
CR51
MON.
SENS.
5&7
1
6
2
3
4
H
H
V51
XV51
R60
15K
K51
10
9
8
7
6
5
T51
4
3
2
1
2A
5A
6A
3A
4A
R7
750K
R9
750K
C5
100UUF
R5
680
C3
.01
7
1
2
5
4
3
6AL5
V1
XV1
C1
100
UUF
C7
100
UUF
L3
REFLECTOMETER
DIODE
R8
750K
R10
750K
C6
100UUF
R6
680
C4
.01
6AL5
V2
XV2
C2
100
UUF
C8
100
UUF
L4
REFLECTOMETER
DIODE
BLK
1A
R53
5.6MEG
WHT-YEL TR
WHT-RED TR
WHT-BLK TR
BLK
WHT-YEL TR
WHT-RED TR
WHT-BLK TR
2C1
.01
0-20
UA
2M1
2E34
2R49
100K
2E48
2E33
2E32
2E51
2E50
2E49
VSWR CAL.
VSWR
PWR
1
2
3
5
6
7
9
10
11
4
8
12
2S1
2R48
100K
2R47-51K
2R28-500K
5B
6B
2E57
2E58
9B
10B
7B
8B
1E91
1E89
1E76
1E68

* THE VALUES OF R62 & R63 MAY BE DIFFERENT FROM THOSE SHOWN OR THEY MAY BE REMOVED FROM THE CIRCUIT TO ADJUST THE SENSITIVITY FOR VARIOUS POWER LEVELS.

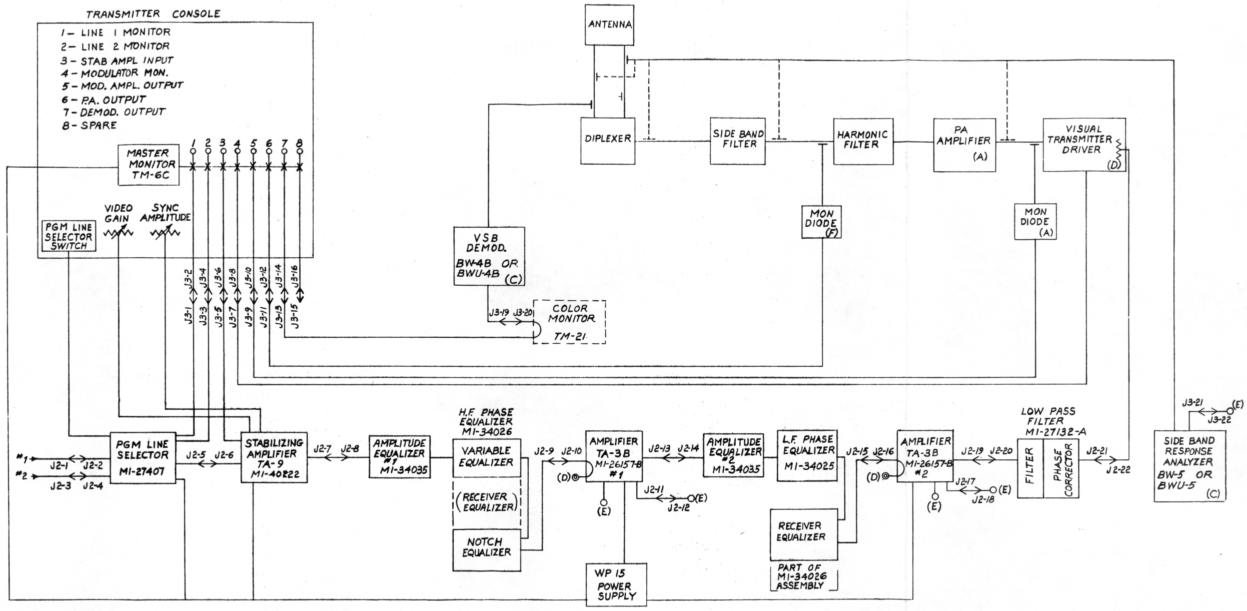
8027023-14

Figure 33—Monitoring Unit MI-19087-A


AUDIO INPUT
LINE 1
1H
2H
9H
10H
15B
16B
S6
R3
AUDIO
GAIN
17B
18B
33H
34H
37H
38H
LIMITING
AMPLIFIER
41H
42H
19B
20B
R21
10DB
21B
22B
49H
50H
55H
56H
AURAL
XMTR
TO
DEPLEXER
AND
ANTENNA
R15
LINE 2
17H
18H
25H
26H
13B
14B
R14
R16
25B
26B
57H
58H
R19,20
M2
VU METER
R17
SPARE 2
35H
36H
39H
40H
11B
12B
R13
AIR MON
XMTR IN
S3
AUDIO MON
SEL
FREQUENCY
MONITOR
65H
66H
27B
28B
63H
64H
SPARE 1
61H
62H
LINE 1
LINE 2
LINE 3
SPARE 1
9B
10B
R12
OFF
11M
12M
41B
42B
M3
AURAL
MODULATION
6M
7M
10A
11A
OVER
MODULATION
SPARE 2
73H
74H
7H
8H
29B
30B
R18
R4
AUDIO MON
GAIN
60B
1B
2B
15H
16H
MONITOR
AMPLIFIER
11K
12K
△ MONITOR CONTROL TURRET TERMINALS
○ MONITORING EQUIPMENT RACK TERMINALS

8437848-0

Figure 34—Aural Signal Circuits Functional Diagram


TRANSMITTER CONSOLE
1 – LINE 1 MONITOR
2 – LINE 2 MONITOR
3 – STAB AMPL INPUT
4 – MODULATOR MON.
5 – MOD. AMPL. OUTPUT
6 – P.A. OUTPUT
7 – DEMOD. OUTPUT
8 – SPARE
MASTER MONITOR TM-6C
1 2 3 4 5 6 7 8
PGM LINE SELECTOR SWITCH
VIDEO GAIN
SYNC AMPLITUDE
J3-1 J3-2 J3-3 J3-4 J3-5 J3-6 J3-7 J3-8 J3-9 J3-10 J3-11 J3-12 J3-13 J3-14 J3-15 J3-16
ANTENNA
DIPLEXER
SIDE BAND FILTER
HARMONIC FILTER
PA AMPLIFIER (A)
VISUAL TRANSMITTER DRIVER (D)
MON DIODE (F)
MON DIODE (A)
VSB DEMOD. BW-4B OR BWU-4B (C)
J3-19 J3-20
COLOR MONITOR TM-21
#1
#2
J2-1 J2-2
J2-3 J2-4
PGM LINE SELECTOR MI-27407
J2-5 J2-6
STABILIZING AMPLIFIER TA-9 MI-40222
J2-7 J2-8
AMPLITUDE EQUALIZER #1 MI-34035
H.F. PHASE EQUALIZER MI-34026
VARIABLE EQUALIZER
(RECEIVER EQUALIZER)
NOTCH EQUALIZER
J2-9 J2-10
(D)
AMPLIFIER TA-3B MI-26157-B #1
(E)
J2-11 J2-12 (E)
WP 15 POWER SUPPLY
J2-13 J2-14
AMPLITUDE EQUALIZER #2 MI-34035
L.F. PHASE EQUALIZER MI-34025
RECEIVER EQUALIZER
PART OF MI-34026 ASSEMBLY
J2-15 J2-16
(D)
AMPLIFIER TA-3B MI-26157-B #2
(E)
J2-17 J2-18 (E)
J2-19 J2-20
LOW PASS FILTER MI-27132-A
FILTER
PHASE CORRECTOR
J2-21 J2-22
J3-21 J3-22 (E)
SIDE BAND RESPONSE ANALYZER BW-5 OR BWU-5 (C)

NOTES

(A) ITEMS REQUIRED ONLY IF AMPLIFIER IS PRESENT

(B) 1- BOTH-ANTENNA LINES MUST BE EQUIPPED WITH MONITOR PICKUPS, ONE TO SERVE DAILY, THE OTHER AS CHECK POINT.
2- IF DEMODULATOR DOES NOT REJECT AURAL SIGNAL, ITS PICKUP POINT MUST PRECEDE THE DIPLEXER.

(C) USE DIRECTIONAL COUPLERS TO SUPPLY SIGNAL TO THE BW-4B AND BW-5A.

(D) PRECISION TERMINATIONS REQUIRED (75Ω ±1%).

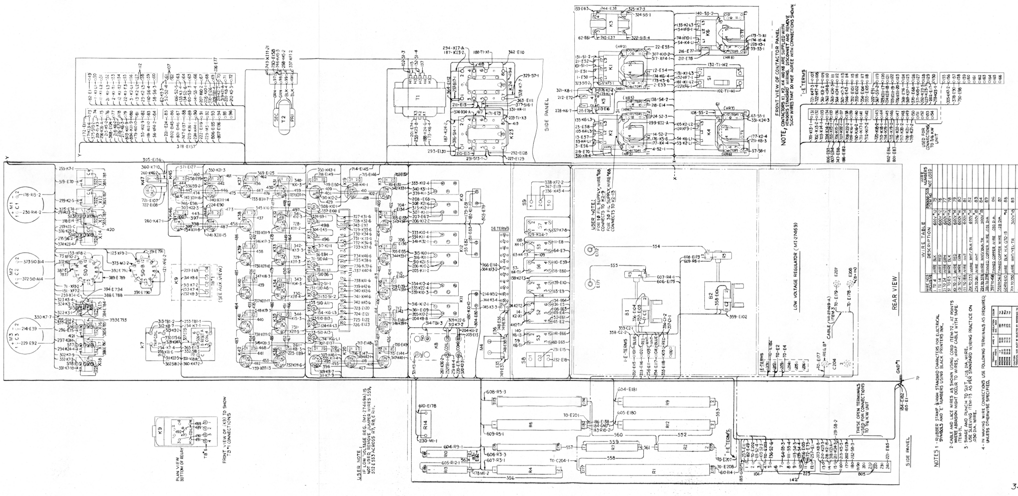
(E) TERMINATIONS REQUIRED (75Ω ±5%).

(F) NOT USED WITH SOME TRANSMITTERS

NOTCH EQUALIZER PORTION OF MI-34026 IS REQUIRED ONLY WHEN A FILTERPLEXER OR NOTCH DIPLEXER REPLACES THE DIPLEXER AS SHOWN.

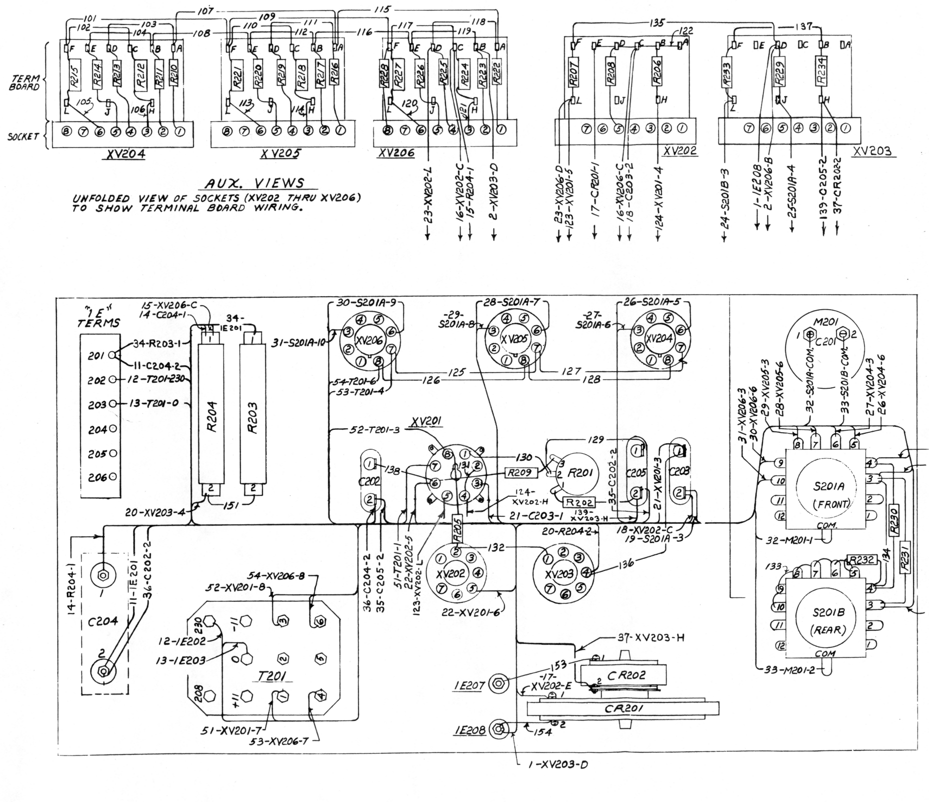
644321-2

Figure 35—Visual Signal Circuits Functional Diagram


REAR VIEW
SIDE PANEL
LOW VOLTAGE REGULATOR
WIRE TABLE
NOTES

3475633

Figure 36—Control Unit Wiring Diagram


AUX. VIEWS
UNFOLDED VIEW OF SOCKETS (XV202 THRU XV206) TO SHOW TERMINAL BOARD WIRING.
TERM BOARD
SOCKET
XV204
XV205
XV206
XV202
XV203
"1E" TERMS
R204
R203
XV201
R201
R209
R202
R205
C202
C205
C203
C204
T201
XV202
XV203
XV206
XV205
XV204
M201
C201
S201A (FRONT)
S201B (REAR)
R230
R231
R232
CR202
CR201
1E207
1E208
1-XV203-D
37-XV203-H
25-XV203-J
19-C203-2
24-XV203-L

WIRE TABLE			
WIRE N^os INCL.	DESCRIPTION	8910658-501 ITEM N^os	WIRE N^os NOT USED
1 & 2	PS-592-10 WIRE WHT/BLK TR. 600V #14AWG.	48	
11 TO 37	PS-592-32 WIRE WHT/BLK TR. 300V. #18AWG.	49	
51 TO 54	PS-592-33 WIRE WHT/GRN TR. 300V. #16AWG.	50	
101 TO 139	PS-105 TINNED COPPER WIRE .050 DIA.	51	
151 TO 154	PS-105 TINNED COPPER WIRE .128 DIA.	52	152

1- RUBBER STAMP 1/8 HIGH STANDARD CHARACTERS FOR ELECTRICAL SYMBOLS USING BLACK PRINTERS INK.

2- CABLE AND LACE WIRES AS SHOWN USING LACING CORD ITEM-44.
AT POINTS WHERE ABRASION TO WIRES MIGHT OCCUR, WRAP CABLE WITH TAPE ITEM-45.

3- USE SLEEVING ITEM-47 ON .050 DIA. WIRE AS REQUIRED.

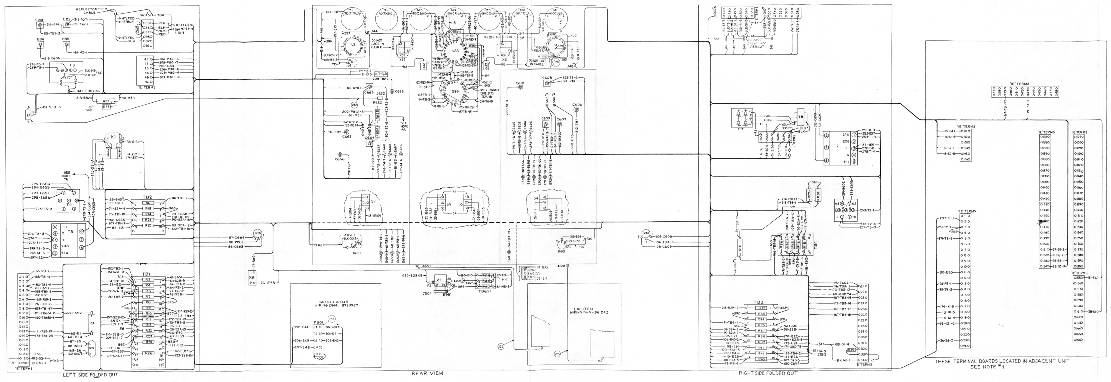
4- USE FOLLOWING TERMINAL TYPES TO SUIT IN MAKING WIRE CONNECTIONS.

99607-2	#10	CLOSED TYPE
99607-4	#6	CLOSED TYPE
818337-5	1/4	CLOSED TYPE

① FOR LIST OF PARTS SEE- 8910658-501.

637946-2

Figure 37—Low Voltage Regulator Wiring Diagram


REFLECTOMETER CABLE
LEFT SIDE FOLDED OUT
REAR VIEW
MODULATOR
WIRING DWG. 8323937
EXCITER
WIRING DWG - 361242
RIGHT SIDE FOLDED OUT
"IE" TERMS
THESE TERMINAL BOARDS LOCATED IN ADJACENT UNIT
SEE NOTE #1

WIRE TABLE			
WIRE NUMBERS	DESCRIPTION	3055326-502 ITEM NO'S.	WIRE NO'S NOT USED
11 THRU 42 INCL.	WIRE-WHT/BLK TR 300V #16	237	
61 THRU 124 INCL.	WIRE-WHT/YEL TR 300V #16	238	
151 THRU 174 INCL.	WIRE-WHT 300V #16	239	
201 THRU 218 INCL.	WIRE-WHT/YEL TR 600V #16	240	
251 THRU 254 INCL.	WIRE-RED 600V #14	241	
271 THRU 276 INCL.	WIRE-GRN 600V #14	242	
291 THRU 299 INCL.	WIRE-BLK 600V #14	243	
311 THRU 313	WIRE-BLK GTO-15 2000V.D.C. #14	244	
321 THRU 324 INCL.	WIRE-BLK 600V #6	245	
341 THRU 349 INCL.	TWISTED PR. SHIELDED(RED & BLK) #18	246	
361	WIRE-TINNED COPPER .128 DIA.	247	
371 THRU 407 INCL.	WIRE-TINNED COPPER .040 DIA.	248	
451 & 452	COAXIAL CABLE RG 58 C/U	250	
461 THRU 463	WIRE-WHT 15KV #10	251	

NOTES:

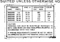
1 ALL "IE" TERMINALS ARE LOCATED IN CONTROL UNIT (ADJACENT TO 6 KW UNIT) DRESS WIRES IN CABLES AS SHOWN TO REACH RESPECTIVE CONNECTIONS IN CONTROL UNIT THEN APPLY LABEL TO EACH WIRE CORRESPONDING TO TERMINAL BOARD NUMBERS.
EXAMPLE: WIRE CONNECTING TO (IE101) TO BE LABLED 101.

2 RUBBER STAMP .19 HIGH STANDARD CHARACTERS FOR ELECTRICAL SYMBOLS AND "E" NUMBERS USING BLACK PRINTERS INK. (PREFIX FOR THIS UNIT IS #2)

3 NUMBERS IN WIRES REFER TO WIRE TABLE AND WIRE DESTINATION RESPECTIVELY, EXAMPLE: 13-S2-4 13 IS WIRE NO., S2 IS COMPONENT SYMBOL FOR WIRE DESTINATION, 4 IS COMPONENT TERMINAL.

4 CABLE WIRES AS SHOWN AND LACE USING ITEM 236, AT POINTS WHERE ABRASION TO WIRES MIGHT OCCUR WRAP CABLE WITH TAPE ITEM 234.

5 IN MAKING WIRE CONNECTIONS USE FOLLOWING TERMINALS AS BEST SUITED UNLESS OTHERWISE NOTED.

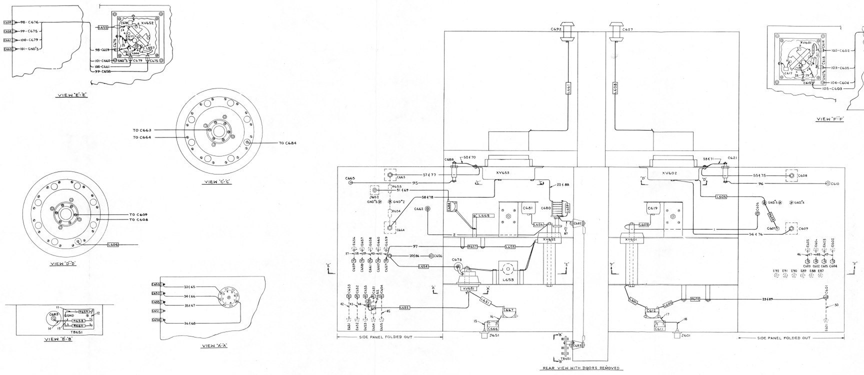


6. LACE WIRES # 323 & # 324 TOGETHER BUT DO NOT LACE IN CABLE WITH OTHER WIRES. DRESS THESE WIRES TOWARD REAR OF CABINET AWAY FROM OTHER WIRING.

7. USE SLEEVING ITEM 249 PER STANDARD WIRING PRACTICE ON .040 DIA. WIRE.

3475642 REV- 2

Figure 38—6 kW Unit Wiring Diagram


VIEW 'E-E'
VIEW 'C-C'
TO C663
TO C664
TO C684
VIEW 'D-D'
TO C609
TO C608
VIEW 'B-B'
VIEW 'A-A'
XV601
XV602
SIDE PANEL FOLDED OUT
REAR VIEW WITH DOORS REMOVED
SIDE PANEL FOLDED OUT
VIEW 'F-F'

WIRE TABLE			
WIRE NUMBERS	DESCRIPTION	ITEM NO'S 3455524-501	WIRE NO'S NOT USED
1 & 2	WIRE, TEFLON INSULATED	246	
11 THRU 29 INCL	WIRE, TINNED COPPER .040 DIA.	248	19, 27
33 THRU 53 INCL	WIRE, TINNED COPPER .064 DIA.	249	
55 THRU 58 INCL	WIRE, TINNED COPPER .128 DIA.	250	
65 THRU 71 INCL	INSUL. SLEEVING BLK. .076 I.D.	251	
75 THRU 78 INCL	INSUL. SLEEVING BLK. .133 I.D.	252	
86 THRU 89 INCL	INSUL. SLEEVING BLK. .055 I.D.	253	
95 THRU 105 INCL	WIRE, WHT/BLK TR, #16	247	

NOTES:

1-RUBBER STAMP .19 HIGH STANDARD CHARACTERS FOR ELECTRICAL SYMBOLS USING BLACK PRINTERS INK. (PREFIX FOR THIS UNIT IS 2.)

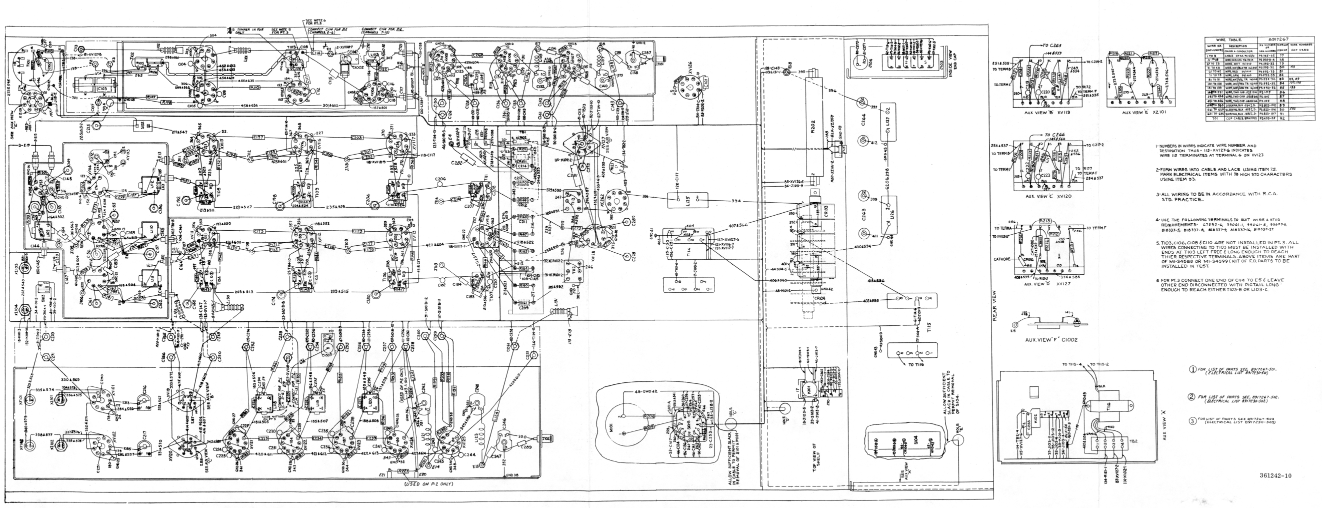
2-CABLE WIRES AS SHOWN AND LACE USING CORD ITEM-254 AT POINTS OF CABLE WHERE ABRASION TO WIRES OR ELECTRICAL SHORT TO SHIELDED CABLE MIGHT OCCUR, WRAP CABLE WITH TAPE ITEM-255

3-IN MAKING WIRE CONNECTIONS USE FOLLOWING TYPE TERMINALS AS BEST SUITED, UNLESS OTHERWISE SPECIFIED.

① FOR LIST OF PARTS SEE 3455524-501 (MECH)
3455525-501 (ELEC)

3475537-2

Figure 39—6 kW R-F Unit Wiring Diagram



WIRE TABLE		8917267		
WIRE NR. (INCLUSIVE)	DESCRIPTION COLOR & CONDUCTOR	PS NUMBER OR DWG NUMBER	PARTS LIST ITEM NR.	WIRE NUMBERS NOT USED
1 TO 3	CABLE CO-AX RG-62/U	PS 745-62	77	
11 TO 18	WIRE, SHIELDED TW. PAIR	PS 705-B-4	78	
17 TO 23	WIRE, WHT 16/.010	PS 592-32	79	
31 TO 48	WIRE, WHT/BLK TR. 16/.010	PS 592-32	80	43
61 TO 62	WIRE, RED 26/.010	PS 592-33	81	
71 TO 73	WIRE, GRN 26/.010	PS 592-33	82	
81 TO 91	WIRE, WHT/YEL TR. 16/.010	PS 592-32	83	83, 89
101 TO 128	WIRE, WHT/RED TR. 16/.010	PS 592-32	84	107, 108
131 TO 139	WIRE, WHT/GRN TR. 16/.010	PS 592-32	85	138
141 TO 291	WIRE, TIND COP. .032 DIA	PS 105	86	
292 TO 434	WIRE, TIND COP. .0508 DIA	PS 105	87	
451 TO 456	WIRE, TIND COP. .0808 DIA	PS 105	88	
498 TO 560	SLEEVING, BLK .034 I.D.	PS 823-102	89	
561 TO 620	SLEEVING, BLK .053 I.D.	PS 823-104	90	582
631 TO 636	SLEEVING, BLK .085 I.D.	PS 823-107	91	
701	COP CABLE, BRAIDED	PS 499-55	92	

1- NUMBERS IN WIRES INDICATE WIRE NUMBER AND DESTINATION THUS - 115-XV127-6 INDICATES WIRE 115 TERMINATES AT TERMINAL 6 ON XV127.

2- FORM WIRES INTO CABLE AND LACE USING ITEM 75. MARK ELECTRICAL ITEMS WITH 1/8 HIGH STD CHARACTERS USING ITEM 93.

3- ALL WIRING TO BE IN ACCORDANCE WITH R.C.A. STD. PRACTICE.

4- USE THE FOLLOWING TERMINALS TO SUIT WIRE & STUD REQUIREMENTS- 67592-6, 99061-1, 99061-5, 99607-6, 818337-5, 818337-8, 818337-9, 818337-16, 818337-27.

5. T103, C106, C108 & C110 ARE NOT INSTALLED IN PT. 3. ALL WIRES CONNECTING TO T103 MUST BE INSTALLED WITH ENDS AT T103 LEFT FREE & LONG ENOUGH TO REACH THIER RESPECTIVE TERMINALS. ABOVE ITEMS ARE PART OF MI-34588 OR MI-34599 (KIT OF F.D. PARTS TO BE INSTALLED IN TEST.

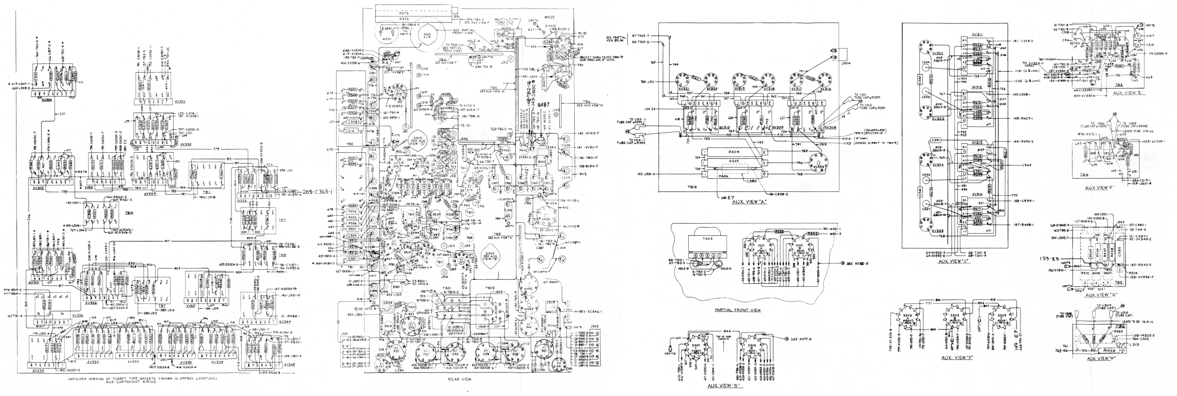
6 FOR PT. 3 CONNECT ONE END OF C114 TO E5 & LEAVE OTHER END DISCONNECTED WITH PIGTAIL LONG ENOUGH TO REACH EITHER T103-B OR L103-C.

① FOR LIST OF PARTS SEE, 8917267-501. (ELECTRICAL LIST 8917230-501)

② FOR LIST OF PARTS SEE, 8917267-502. (ELECTRICAL LIST 8917230-502)

③ FOR LIST OF PARTS SEE 8917267-503 (ELECTRICAL LIST 8917230-503)

Figure 40—Aural and Visual Exciter Wiring Diagram



WIRE NOS. INCLUSIVE	DESCRIPTION		852/300-501 ITEM NO.	WIRE NOS. NOT USED
1 TO 9	WIRE, RED	#18	99	
11 TO 13	WIRE, GRN	#18	100	
21 TO 29	WIRE, WHT/BLK TR	#18	104	
41 TO 42	WIRE, WHT/GRN. TR.	#12	106	
61 TO 72	WIRE, WHT/GRN. TR.	#16	105	
101 TO 104	WIRE, WHT/GRN. TR.	#18	102	
123 TO 177	WIRE, WHT/RED TR.	#18	101	[illegible]
201 TO 211	WIRE, WHT/YEL TR.	#18	103	[illegible]
401 TO 427	CABLE COAX. RG-174 50 OHM		83	[illegible]
451 TO 463	CABLE COAX. RG-179A/U 75 OHM		81	
497 TO 549	WIRE, TINNED COPPER .025 DIA.		90	531
551 TO 700	WIRE, TINNED COPPER .032 DIA.		91	[illegible] 572, 615
701 TO 866	WIRE, TINNED COPPER .040 DIA.		92	[illegible]
1001 TO 1006	WIRE, TINNED COPPER .080 DIA.		94	[illegible]
902 TO 947	WIRE, TINNED COPPER .064 DIA.		93	[illegible]
971 TO 983	WIRE, TINNED COPPER .032 DIA.		91	[illegible]
1101 TO 1104	WIRE, TINNED COPPER .128 DIA.		95	

NOTES

1- MARK 1/8 HIGH STANDARD CHARACTERS FOR ELECTRICAL SYMBOLS AND TE NOS. USING BLACK PRINTERS INK, EXCEPT FOR COMPONENTS MOUNTED ON OR DIRECTLY CONNECTED TO TURRET TYPE SOCKETS.

2- NUMBERS IN OR AT WIRES REFER TO WIRE TABLE AND WIRE DESTINATION RESPECTIVELY. EXAMPLE: (144-R492-2)
WIRE NO.-SEE TABLE
WIRE CONNECTS TO TERMINAL-2 OF COMPONENT-R492.

3- FORM WIRES INTO CABLE AND LACE USING ITEM-88

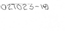
4- USE INSULATING TUBING (SLEEVING) ON WIRE BUS OR COMPONENT PIG TAILS WHERE NECESSARY.

5- IN MAKING WIRE CONNECTIONS USE FOLLOWING TERMINALS AS BEST SUITED UNLESS OTHERWISE NOTED.
818337-2, 5, 9
99607-2, 4.
8902750-19 (SOLDERLESS)

6- * WHERE ASTERISK IS NOTED, DRESS THESE WIRES POINT TO POINT AND CLEAR OF CHASSIS.

7- IN GENERAL, BUS WIRE LEADS ARE TO BE DRESSED DIRECTLY FROM POINT TO POINT. OTHER WIRING IS TO BE CABLED OR ROUTED ALONG CHASSIS. SEE NOTE 6.

8- ADD TO BOTH ENDS OF COAX. A SHIELD TERMINATING FERRULE AND TERMINAL FOR CENTER CONDUCTOR AS SHOWN BY ILLUSTRATION. ADD GROUND WIRE WHERE NOTED BY WIRING DIAG.

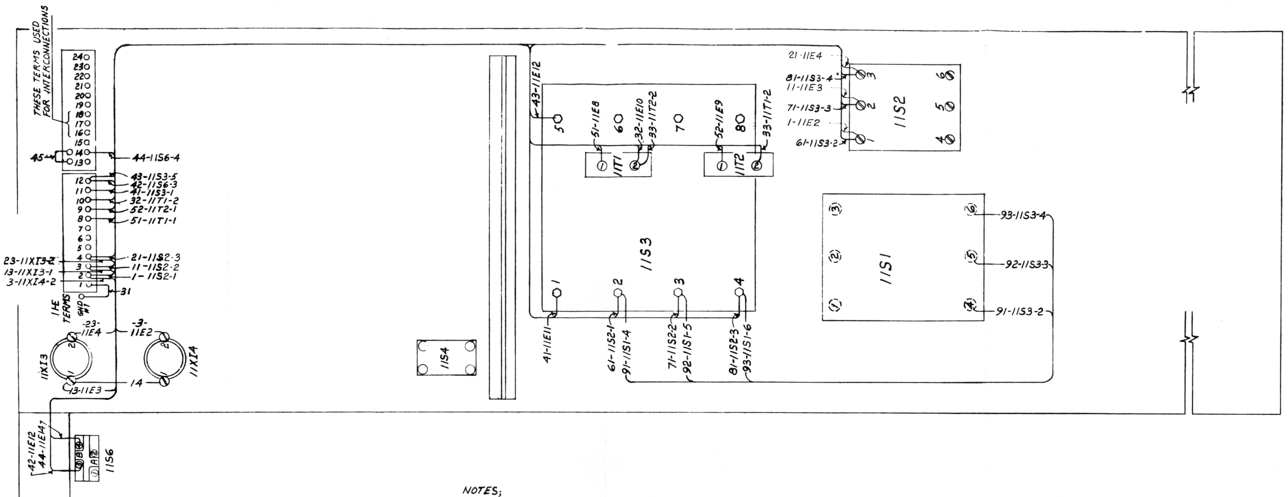


FOR ASSY OF FERRULE TO CABLE, SEE MFG. SPEC. #333

9- DO NOT ORDER FOR S.O. 81694. MAT'L WILL BE SUPPLIE AS A KIT.

8027023-19

Figure 41—Visual Modulator Wiring Diagram


THESE TERMS USED FOR INTERCONNECTIONS
24
23
22
21
20
19
18
17
16
15
14
13
45
44-11S6-4
12
11
10
9
8
7
6
5
4
3
2
1
43-11S3-5
42-11S6-3
41-11S3-1
32-11T1-2
52-11T2-1
51-11T1-1
21-11S2-3
11-11S2-2
1-11S2-1
23-11XI3-2
13-11XI3-1
3-11XI4-2
31
1E TERMS
GND #1
-23- 11E4
-3- 11E2
11XI3
11XI4
14
13-11E3
42-11E12
44-11E14
B
A
11S6
11S4
43-11E12
5
6
7
8
51-11E8
32-11E10
33-11T2-2
52-11E9
33-11T1-2
11T1
11T2
11S3
41-11E11
61-11S2-1
91-11S1-4
71-11S2-2
92-11S1-5
81-11S2-3
93-11S1-6
21-11E4
81-11S3-4
11-11E3
71-11S3-3
1-11E2
61-11S3-2
11S2
11S1
93-11S3-4
92-11S3-3
91-11S3-2

NOTES;

1- RUBBER STAMP 3/16 HIGH STANDARD CHARACTERS FOR ELECTRICAL SYMBOLS USING BLK PRINTERS INK.

2- CABLE AND LACE WIRES AS SHOWN USING LACING CORD ITEM-44.

3- IN MAKING WIRE CONNECTIONS, USE FOLLOWING TERMINALS AS REQUIRED.

K-99607-2	#10	CLOSED TYPE
K-818337-5	1/4	CLOSED TYPE

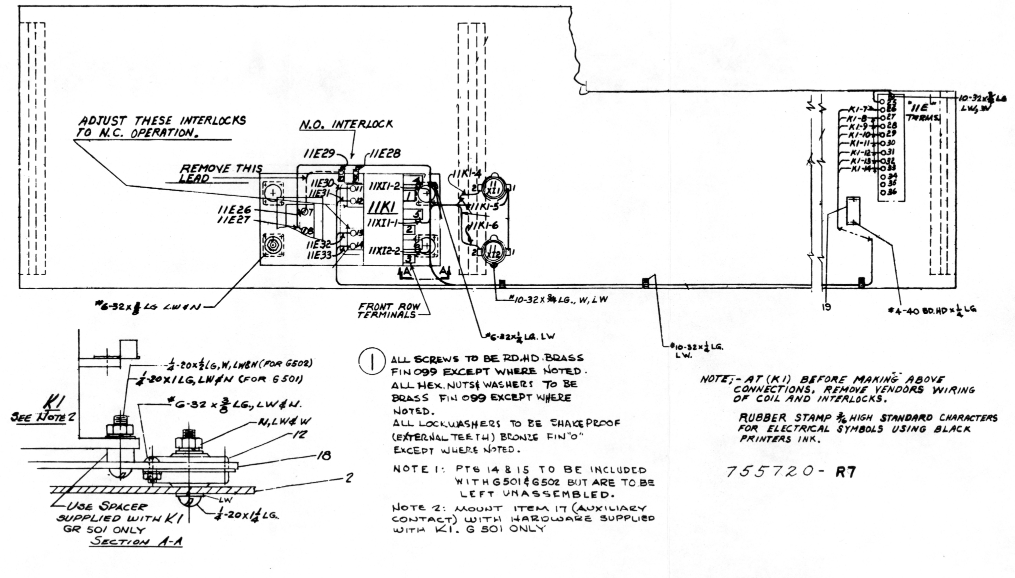
8612451-0

① FOR LIST OF PARTS SEE - 8908847

WIRE TABLE			WIRE Nº. NOT USED
WIRE Nº. INCLUSIVE	DESCRIPTION	8908847 ITEM Nº.	
1 TO 3	PS-592-97 WIRE BLK #12 600V	47	
11 TO 15	PS-592-97 WIRE RED #12 600V	48	
21 TO 23	PS-592-97 WIRE GRN #12 600V	49	
31 TO 33	PS-592-33 #16 WIRE WHT 300V	50	
41 TO 45	PS-592-33 #16 WIRE WHT/BLK TR 300V	51	
51 TO 52	PS-592-33 #16 WIRE WHT/YEL TR 300V	52	
61	PS-592-98 WIRE BLK #10 600V	53	
71	PS-592-98 WIRE RED #10 600V	54	
81	PS-592-98 WIRE GRN #10 600V	55	
91 TO 93	PS-751-6 WIRE BLK #2 600V	46	

Figure 42—Switchgear Panel Wiring Diagram

NOTE; SCHEMATIC PREFIX NUMBER FOR G501 & 502---11
WHEN ASSIGNING NEW ELECTRICAL SYMBOLS
DO NOT DUPLICATE NUMBERS ON 8908847


ADJUST THESE INTERLOCKS TO N.C. OPERATION.
N.O. INTERLOCK
11E29
11E28
REMOVE THIS LEAD
11E30
11E31
11E26
11E27
11E32
11E33
11X11-2
11K1
11X11-1
11X12-2
1
5
2
3
11K1-4
11K1-5
11K1-6
11 X11
11 X12
A
A
K1-7
K1-8
K1-9
K1-10
K1-11
K1-12
K1-13
K1-14
25
26
27
28
29
30
31
32
33
34
35
36
"11E" TERMS.
10-32x⅜ LG LW, W
#6-32x⅜ LG LW & N
FRONT ROW TERMINALS
#10-32 X ¾ LG., W, LW
#6-32x¼ LG. LW
#10-32x¼ LG. LW.
19
#4-40 BD.HD x ¼ LG
¼-20x½ LG, W, LW&N (FOR G502)
¼-20X1 LG, LW & N (FOR G501)
#6-32 x ⅜ LG., LW & N.
N, LW & W
12
18
2
K1
SEE NOTE 2
LW
¼-20X1¼ LG.
USE SPACER SUPPLIED WITH K1 GR 501 ONLY
SECTION A-A

① ALL SCREWS TO BE RD.HD. BRASS FIN 099 EXCEPT WHERE NOTED.
ALL HEX. NUTS & WASHERS TO BE BRASS FIN 099 EXCEPT WHERE NOTED.
ALL LOCKWASHERS TO BE SHAKEPROOF (EXTERNAL TEETH) BRONZE FIN "0" EXCEPT WHERE NOTED.

NOTE 1: PTS 14 & 15 TO BE INCLUDED WITH G501 & G502 BUT ARE TO BE LEFT UNASSEMBLED.

NOTE 2: MOUNT ITEM 17 (AUXILIARY CONTACT) WITH HARDWARE SUPPLIED WITH K1. G 501 ONLY

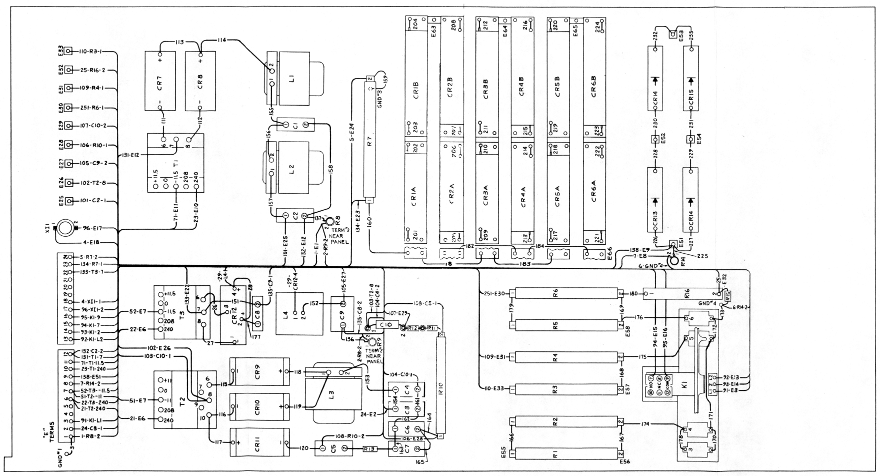
NOTE;- AT (K1) BEFORE MAKING ABOVE CONNECTIONS, REMOVE VENDORS WIRING OF COIL AND INTERLOCKS.

RUBBER STAMP 3/16 HIGH STANDARD CHARACTERS FOR ELECTRICAL SYMBOLS USING BLACK PRINTERS INK.

755720- R7

Figure 43—Plate Contactor Panel Wiring Diagram

WIRE TABLE			
WIRE NUMBERS	DESCRIPTION	3455522 -501 ITEM NO'S	WIRE NO'S NOT USED
1 THRU 7 INCL.	WIRE, WHITE 600V #14	39	
21 THRU 29 INCL.	WIRE, BLACK 600V #14	40	
51 AND 52	WIRE, RED 600V #14	41	
71	WIRE, GREEN 600V #14	42	
91 THRU 96 INCL.	WIRE, WHT-BLK-TR 600 V #14	43	
101 THRU 120 INCL.	WIRE, BLACK HV (6 TO 15) #14	44	
131 THRU 138 INCL.	WIRE, YELLOW 600 V #14	45	
151 THRU 184 INCL.	TINNED COPPER WIRE .128 DIA.	47	
201 THRU 233 INCL.	TINNED COPPER WIRE .050 DIA.	48	
251	WIRE, WHITE H.V. 15 KV. DC #10	46	


CR7
CR8
T1
L1
L2
R7
CR1B
CR2B
CR3B
CR4B
CR5B
CR6B
CR1A
CR7A
CR3A
CR4A
CR5A
CR6A
CR13
CR14
CR15
T3
CR12
L4
C9
R6
R5
R4
R3
R2
R1
R16
K1
T2
CR9
CR10
CR11
L3
C5
R10
XI
"E" TERMS
GND#1
TERM #2 NEAR PANEL
TERM #3 NEAR PANEL

NOTES:

1- RUBBER STAMP .19 HIGH STANDARD CHARACTERS FOR ELECTRICAL SYMBOLS USING BLK PRINTERS INK. (PREFIX FOR THIS UNIT #12)

2- CABLE AND LACE WIRES AS SHOWN USING CORD ITEM - 38.

3- SWAGE AND PUNCH TO SUIT, .128 DIA. WIRE.

4- IN MAKING WIRE CONNECTIONS USE FOLLOWING TERMINALS AS REQUIRED UNLESS OTHERWISE SPECIFIED.

TERMINAL DWG	PARTS	AWG #	INSULATION DIA MAX	COLOR
8982998	1-6	22-26	082	Yel
8982998	10-21	18-22	136	Red
8982998	25-32	14-16	170	Blue
8982998	36-46	10-12	275	Yel
8982998	50-60	14-16	275	Yel

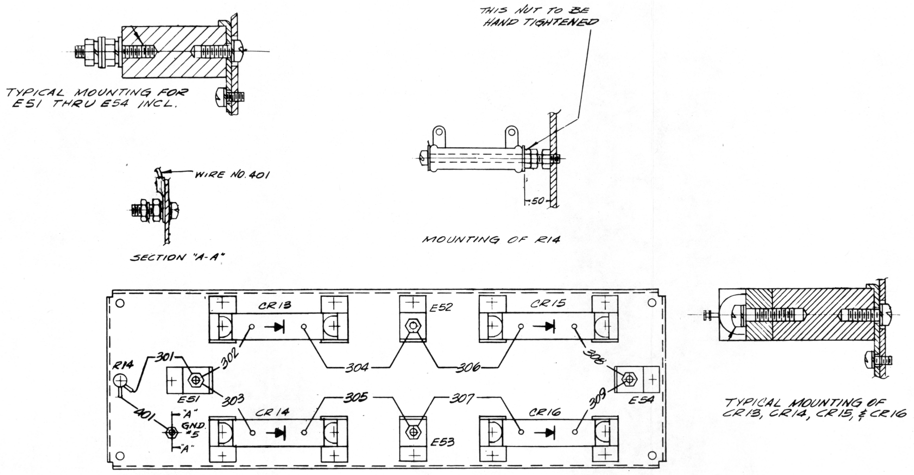
CAUTION
TERMINAL SIZE MUST BE SELECTED BY REFERENCE TO BOTH AWG WIRE SIZE AND INSULATION DIAMETER, IN ACCORDANCE WITH THIS TABLE

IF WIRING REQUIREMENTS CANNOT BE MET BY ABOVE, AN APPROVED SOLDER TYPE TERMINAL SHOULD BE USED

LAST NUMBERS USED:
E1 THRU E33 INCL.
E51 THRU E58 INCL.
E63 THRU E66 INCL.
GND 1 THRU 4 INCL.

3475512-2

Figure 44—Rectifier Panel Wiring Diagram


TYPICAL MOUNTING FOR
E51 THRU E54 INCL.
THIS NUT TO BE
HAND TIGHTENED
WIRE NO. 401
SECTION "A-A"
.50
MOUNTING OF R14
CR13
E52
CR15
R14
301
302
304
306
308
E51
303
305
307
309
E54
401
"A"
GND.
#5
"A"
CR14
E53
CR16
TYPICAL MOUNTING OF
CR13, CR14, CR15, & CR16

WIRE TABLE	
WIRE NUMBERS	DESCRIPTION
301 THRU 309	TINNED COPPER WIRE .050 DIA.
401	WIRE, WHITE 600V #14

8027023-23

① **ASSEMBLY GR 501**
RUBBER STAMP .19 HIGH ST'D CHARACTERS FOR ELECTRICAL SYMBOLS USING BLACK PRINTERS INK. CONNECT (PT. 22) TO TIE POINT ENDS ONLY OF WIRES 301 TO 309 INCL.

Figure 45—Rectifier Assembly Wiring Diagram

LINE NUMBER	MAT'L.	WIRE DESCRIPTIO			CONTROL UNIT (PREFIX 1)	6 KW UNIT (PREFIX 2)		TRANS-FILTER (PREFIX 10)	SWITCHGEAR (PREFIX 11)	RECTIFIER PNL. (PREFIX 12)		LINE REGULATOR MI-27472	REG CONTROL PNL. MI-27471			
	MI-34593-A IT. NO.	COLOR	TRACER	AWG SIZE												
1	1	WHT	YEL	16	131	21										
2	↑	WHT	YEL	16	132	22										
3		WHT	YEL	16	133	23										
4		WHT	YEL	16	134	24										
5	CABLE ASSEMBLY	WHT	YEL	16	139	1										
6		WHT	YEL	16	140	2										
7		WHT	YEL	16	141	3										
8		WHT	YEL	16	142	4										
9	↓	WHT	YEL	16	143	5										
10	1	WHT	YEL	16	144	6										
11																
12	2	WHT	BLK	16	24	18										
13				16												
14	3	RED	—	16	3	P302- 1										
15	↑	ORN	—	16	5	P302- 2										
16		WHT	BLK	16	152	P302- 3										
17		WHT	BLK	16	155	P302- 4										
18		WHT	BLK	16	151	P302- 5										
19		WHT	BLK	16	149	P302- 6										
20		WHT	BLK	16	150	P302- 7										
21																
22		WHT	BLK	16	161	P302- 9										
23		WHT	BLK	16	23	P302- 11										
24		WHT	BLK	16	17	P302- 12										
25		WHT	BLK	16		P302- 10										
26																
27	CABLE ASSEMBLY															
28		RED	—	16	9	P103- 1										
29		GRN	—	16	10	P103- 2										
30		ORN	—	16	12	P103- 3										
31		WHT	BLK	16	20	P103- 4										
32		WHT	—	16	11	P103- 5										
33		WHT	BLK	16	17	P103- 6										
34		WHT	BLK	16	159	P103- 7										
35		WHT	BLK	16	160	P103- 8										
36		WHT	BLK	16	21	P103- 9										
37		WHT	BLK	16	22	P103- 10										
38	↓	WHT	BLK	16	15	P103- 11										
39	3	WHT	BLK	16	18	P103- 12										
40																
41																
42																
43	4	YEL	—	14	177	87										
44	↑	YEL	—	14	181	88										
45	CABLE ASS'Y	YEL	—	14	171	89										
46	↓	YEL	—	14	179	90										
47	4	YEL	—	14	180	91										

3464056-2.

Figure 46—Wire Chart (Sheet 1 of 5)

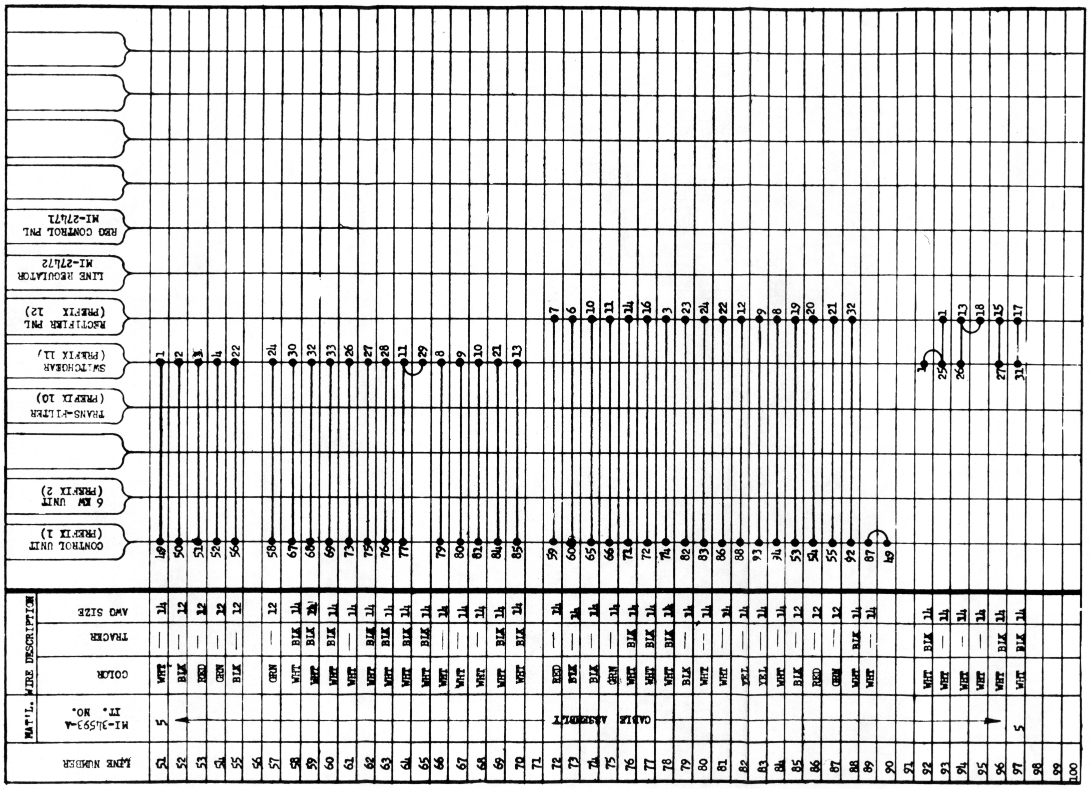
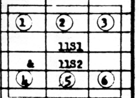
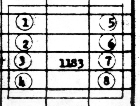

RGO CONTROL PNL MI-27471
LINE REGULATOR MI-27472
RECTIFIER PNL (PREFIX 12)
SWITCHGEAR (PREFIX 11)
TRANS-FILTER (PREFIX 10)
6 KW UNIT (PREFIX 2)
CONTROL UNIT (PREFIX 1)
MAT'L.
WIRE DESCRIPTION
MI-34593-A IT. NO.
COLOR
TRACER
AWG SIZE
LINE NUMBER
CABLE ASSEMBLY

Figure 46—Wire Chart (Sheet 2 of 5)

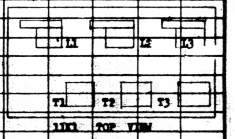
LINE NUMBER	MAT'L MI-34593-A ITEM NO.	WIRE DESCRIPTION COLOR	TRACER	AWG. SIZE	CONTROL UNIT (PREFIX 1)	6-KW UNIT (PREFIX 2)		TRANS-FILTER (PREFIX 10)	SWITCHGEAR (PREFIX 11)	RECTIFIER PNL (PREFIX 12)		LINE REGULATOR MI-27472	REG CONTROL PNL MI-27471			
101	6	BLK		14HV	178					25						
102	CABLE ASSEMBLY	YEL		14		41				2						
103		YEL		14		42				26						
104		YEL		14		43				29						
105		YEL		14		44				27						
106		YEL		14		45				28						
107		WHT		10HV		85				30						
108		BLK		14HV		82				33						
109	6	BLK		14HV		84				31						
110																
111	7	BLK		14HV	172	92										
112																
113	8	BLK	RG-2	13/U		(Z1)J2			J1(K1)							
114																
115	9	BLK	RG-2	13/U		M6-1				55						
116																
117	10	BLK		4				T2-H1	K1-L1							
118	CABLE ASS'Y	BLK		4				T2-H2	K1-L2							
119	10	BLK		4				T2-H3	K1-L3							
120																
121	11	BLK		12				T1-1	K1-L2							
122	CABLE ASSEMBLY	RED		12				T1-5	K1-L3							
123		BLK		14HV				T1-7		54						
124		BLK		14HV				T1-9		52						
125		BLK		14HV				L1-1		53						
126		BLK		14HV				L1-2		57						
127		WHT		12				C2-1		GND #4						
128		WHT		10HV				L2-2		56						
129		WHT		10HV				L3-2		58						
130		WHT		10HV				L2-1		66						
131		WHT		10HV			(PHASE A)	T2-R2		63						
132		WHT		10HV			(PHASE B)	T2-R2		64						
133	11	WHT		10HV			(PHASE C)	T2-R2		65						
134																
135	12	BLK		4					S3-6							
136	CABLE ASS'Y								K1-T1							
137		BLK		4					S3-7							
138									K1-T2							
139	12	BLK		4					S3-8							
140									K1-T3							
141																
142	13	RED		12						19						
143	CABLE ASS'Y	BLK		12						20						
144	13	GRN		12						21						
145																
146																
147																
148																
149																
150																



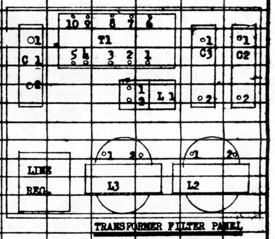
1
2
3
11S1
&
11S2
4
5
6



1
2
3
4
11S3
5
6
7
8



L1
L2
L3
T1
T2
T3
11K1 TOP VIEW



C 1
1
2
T1
10 9 8 7 6
5 4 3 2 1
L 1
1
2
C3
1
2
C2
1
2
LINE REG.
L3
1
2
L2
1
2
TRANSFORMER FILTER PANEL

TO BLOWER MOTOR 10B1 CONNECT PER NAMEPLATE ON MOTOR FOR "HUN-LOW" VOLTS CONNECT"

Figure 46—Wire Chart (Sheet 3 of 5)

LINE NUMBER	MAT'L. MI-34593-A ITEM NO.	WIRE DESCRIPTION COLOR	TRACER	AWG. SIZE	CONTROL UNIT (PREFIX 1)	6-KW UNIT (PREFIX 2)		TRANS-FILTER (PREFIX 10)	SWITCHGEAR (PREFIX 11)	RECTIFIER PNL (PREFIX 12)		LINE REGULATOR MI-27472	REJ CONTROL PNL MI-27471		MONITORING UNIT MI-19087-A	
151	14	BLK		12					S2-4			TB1-1				
152	↑	GRN		12					S2-6			TB1-4				
153		BLK		12					22			TB1-8				
154		GRN		12					24			TB1-4				
155		WHT		16					1				1			
156		WHT		16									7			
157	CABLE ASSEMBLY	BLK		16					22				2	REMOVE JUMPERS		
158		RED		16					24				3	(IF INSTALLED)		
159		RED		16					21				8			
160		WHT	BLK	16								TB2-2	4			
161	↓	YEL		16								TB2-1	5			
162	14	WHT	YEL	16								TB2-3	6			
163																
164																
165	15	COPPER STRAP 1"			GND	GND										
166	↑	COPPER STRAP 1"						GND #1		GND						
167		COPPER STRAP 1"						GND #1				TO BLOWER FRAME				
168	↓	COPPER STRAP 1"							GND	GND						
169	15	COPPER STRAP 1"						GND				TO 1OT2 FRAME				
170																
171																
172	16	COPPER STRAP 3"				GND				GND						
173	16	COPPER STRAP 3"							GND			STATION GROUND				
174																
175																
176	NOT SUPPLIED			4					S1-1				208/240 VOLT			
177	NOT SUPPLIED			4					S1-2				3 PHASE POWER LINE			
178	NOT SUPPLIED			4					S1-3							
179	NOT SUPPLIED			18		P104-1							117 VOLT SUPPLY			
180	NOT SUPPLIED			18		P104-2							CRYSTAL HEATERS			
181	NOT SUPPLIED			16					13	REMOVE JUMPER						
182	NOT SUPPLIED			16					14							
183	NOT SUPPLIED			16					15				VSBF REJ. LOAD INTLK.			
184	NOT SUPPLIED			16					15				DUMMY LOAD INTLK.			
185	NOT SUPPLIED			16					16							
186																
187																
188	MI 34498-1	COLOR	TRACER	AWG.SIZE												
189																
190																
191	6	WHT		10HV				L3-1								
192								T2-M								
193						47		WHT/RED								
194						48		WHT/BLK	MI-27464							
195						51		WHT/YEL	AURAL REFLECTOMETER							
196						52		BLK								
197																
198																
199																
200																

Figure 46—Wire Chart (Sheet 4 of 5)

LINE NUMBER	MAT'L MI-34498-2	WIRE DESCRIPTION COLOR	TRACER	AWG. SIZE	CONTROL UNIT (PREFIX 1)	6-KW UNIT (PREFIX 2)		TRANS-FILTER (PREFIX 10)	SWITCHGEAR (PREFIX 11)	RECTIFIER PNL (PREFIX 12)		LINE REGULATOR MI-27472	REG CONTROL PNL MI-27471		MONITORING UNIT MI-19087-A	
201						GND									GND	
202	7	TWISTED PAIR				48									1B	
203		SHIELDED				49									2B	
204						53	REMOVE JUMPER									
205	7	TWISTED PAIR				50									3B	
206		SHIELDED				51									4B	
207						54	REMOVE JUMPER									
208	6	BLK		16		57									5B	
209	6	BLK		16		58									6B	
210	6	BLK		16	76										7B	
211	6	BLK		16	68										8B	
212	6	BLK		16	91										9B	
213	6	BLK		16	89										10B	
214	5	WHT		10H V				L2-1								
215								L3-1								
216																

Figure 46—Wire Chart (Sheet 5 of 5)

RCA Communications
Systems Division

Communications Systems Division/Front and Cooper Streets/Camden, New Jersey, U.S.A. 08102
Printed in U.S.A.